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RADICAL OPERATIONS FOR MAJOR TRIGEMINAL NEURALGIA

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From a personal experience with 654 major operations for major trigeminal neuralgia, tic douloureux, I am convinced that from every point of view—relief to the patient, the almost total elimination of operative hazards and complications, and the invisible scar—the operation is one from which the surgeon derives greater satisfaction than after any other surgical experience.

In the neurosurgical clinic of the Hospital of the University of Pennsylvania an exceptional opportunity has been afforded to observe neuralgias of the trigeminal system. Ever since Spiller in 1898 proposed section of the sensory root as a substitute for excision of the ganglion of Gasser, I have followed this method and, more because of my associate Dr. Spiller's suggestion than for any other reason, an exceptional number of patients have been referred to this clinic for surgical relief. In this period of approximately thirty years, 1,317 cases of major trigeminal neuralgia have been admitted to the clinic, and of this number the major operation has been performed in 654 cases. During this period the mortality has been reduced to 0.26 per cent.

By "major trigeminal neuralgia" I imply that form of neuralgia otherwise referred to as tic douloureux, and I refer to a symptom complex so easily recognized by those familiar with its expression, so definite and unmistakable in its various constituent features that mistakes in diagnosis should be very exceptional. That mistakes may be made once in a while may be admitted when one realizes that there are almost no objective symptoms, except the vasomotor phenomena and the facial spasm. It would be quite possible for a patient familiar with the disease to describe so accurately the features of trigeminal neuralgia that one might with perfect propriety advise and resort to operation.

With an individual experience of 1,317 cases, one would quite naturally draw the conclusion that the disease is not infrequent in the physician's rounds. Such, however, is far from the case. I once inquired of a general practitioner, who at the age of 60 had had an enormous experience in private and hospital practice, how many cases of major trigeminal neuralgia he had seen. He could remember but two. The answer was as I had expected, and there are many practitioners who have never seen a single case. Hence, while contact with the neuralgia patient is a daily experience in our clinic, many a practitioner has had no opportunity to make any observations at all, and it follows, as one would expect, that the successful measures for controlling pain are not matters of common information.

The diagnostic features of major trigeminal neuralgia are so characteristic and distinctive that I shall not dwell on them here but refer the reader to earlier contributions.[1]

That one is occasionally puzzled I admit, but under these circumstances a ready diagnostic measure in the alcoholic injection is always at hand. If an effectual alcoholic injection, that is, one which induces anesthesia at once in the zone supplied by the division injected, does not give absolute and immediate relief of pain in the same distribution, whatever form of neuralgia the patient may have and whatever the character and intensity of pain, that patient does not have major trigeminal neuralgia. From this deduction there is no avenue of escape. The term trigeminal neuralgia, or tic douloureux, I find is loosely used at times, especially by those who deal with the sinuses. There is no relation between sinus disease and tic douloureux, and this is another indisputable statement to which there is no exception.

Nothing can be accomplished by a discussion of the etiology. This discussion would lead only into the field of speculation. It might serve many a future patient a useful purpose to state emphatically that dental and sinus infections are not factors. The teeth should be left alone and the sinuses left undrained.

The major purpose of this contribution is to relate my experience with the 654 major operations. The major operation is not urged on every patient. It is my practice now, as it always has been, to leave to the patient the choice as to whether he shall have an alcoholic injection or submit to the operation. Low as the mortality is, it should be the patient's privilege to decide after he understands fully what may be expected of each.

The first radical operation, excision of the gasserian ganglion, for the relief of trigeminal neuralgia was proposed simultaneously by Krause of Berlin and Hartley of New York in 1894. In 1898 came Spiller's proposal that, as a substitute for excision of the gasserian ganglion, the sensory root of the ganglion be cut. I always liked Van Gehuchten's[2] paraphrase of this suggestion, "the physiologic extirpation of the ganglion." The first purposeful section of the sensory root for the relief of trigeminal neuralgia was performed in this clinic in 1901.[3] Since that time many modifications in the performance of the operation have been made, some of major and some of minor importance. Of the major modifications there are two. In 1915 I practiced for the first time subtotal section of

1. Frazier, C. H., and Spiller, W. G.: Philadelphia M. J. **8**: 1039 (Dec. 14) 1901; Physiologic Extirpation of the Ganglion of Gasser, J. A. M. A. **43**: 943 (Oct. 1) 1904. Frazier, C. H.: Division of Sensory Root on Both Sides, ibid. **87**: 1730 (Nov. 20) 1926. Frazier, C. H., and Whitehead, Edward: Brain **48**: 458 (Dec.) 1925. Frazier, C. H.: Subtotal Resection of Sensory Root for Relief of Major Trigeminal Neuralgia, Arch. Neurol. & Psychiat. **13**: 378 (March) 1925.
2. Van Gehuchten, A.: Le névraxe **5**: 199, 1903-1904; Univ. Pennsylvania M. Bull. **17**: 50 (April) 1904.
3. Spiller and Frazier (footnote 1, first reference).

the sensory root but did not report the results of my experience until 1925.[4] The fundamental reasons for the introduction of this modification will be found in a subsequent article.[5] The outstanding advantage of this variation in technic, which implied conservation of the ophthalmic portion of the sensory root, was the total elimination of trophic keratitis as a complication. Of this I shall speak later.

The second major modification of the operation was the conservation of the motor root, first proposed in 1918 but not referred to in print until 1926.[6] To conserve the innervation of the temporal, masseter and pterygoid muscles has obvious advantages, chiefly these: to conserve the power of mastication, to better the cosmetic results and to permit the radical operation on both sides, should the disease be bilateral. That the latter is not a theoretical advantage was dramatically illustrated in a patient from Lima, Peru, on whom I had first operated in 1917. She returned in 1926 with pain on the opposite side. In 1917 the motor root was not conserved and if I did not conserve the motor root at the second operation on the opposite side, the situation would be tragic. As it was my initial experience with such a contingency, I urged the patient to have an alcoholic injection. She absolutely refused. I told her she would not be able to close her mouth or chew for the rest of her life if my technic was not perfect, but even then she would not release me. So the operation was performed, the motor root conserved, and all was well.

Fig. 1.—Area of anesthesia five days after section of the outer third of the sensory root.

That the results of the major operation are in the whole eminently satisfactory, a host of patients will testify. With respect to any operation, one must speak of the risk; naturally it is uppermost in the mind of the patient. Desperate as the situation seems, for the pain has become intolerable, the patient's first question is: What are the risks of operation? A direct answer must be given, and if the patient is told that there has been in this clinic but one fatality in the last series of 377 cases, his apprehension on this score is at once relieved. That the operative hazard could be reduced to zero in any large series seems improbable, especially as one is dealing with many patients in the sixties and seventies. In my clinic one patient died ten days after the operation from apoplexy, while another, in the hospital at the same time awaiting operation, died from the same cause. Whether in the hands of many surgeons the subtentorial operation on the sensory root, as recently advocated, will ever be as free from operative hazards as the temporal route, is regarded by those competent to judge as too unreasonable even to answer.

The patient's second question is: Are the results permanent? Since the sensory root in whole or in part cannot undergo regeneration after it is once divided, the answer is obvious. Frankly I admit on two occasions having overlooked a single fasciculus, once of the second and once of the third distributions, but I rather welcome this opportunity to admit a human imperfection, as I am always somewhat incredulous of the 100 per cent surgeon. In these two cases there was a recurrence, and a second operation was performed. But in principle the operation, perfectly performed, is essentially radical and implies permanent relief. Of this guarantee the patient is often skeptical, so often has he been disappointed by many such assurances by other methods of treatment, inappropriate as they are.

Many patients have been given a lurid account of the operation before they consult the physician. Many a physician today harks back to the operations of the nineties. And his patient has been warned: There is a high mortality; there is a likelihood of facial disfigurement; he may lose the sight of one eye.

Of facial disfigurement there is this to be said: The scar is invisible, but in two cases in a hundred, one may anticipate a transitory facial paresis, which makes its appearance from one to seven days after operation, slow in its development and slow but sure in its recovery. There has been much speculation as to its etiology, and, while one cannot speak dogmatically, I am reasonably sure that the paralysis is due to injury to the great superficial petrosal nerve. Furthermore, I think this complication may be avoided if one takes a simple precaution in technic.

In the triangular space posterior to the ganglion, as one elevates the temporal lobe extradurally, one finds the base of the skull still covered with a membrane. Anatomically it is undesignated, but it may be assumed to be a continuation of the envelop of the gasserian ganglion. Underneath this membrane courses the great superficial petrosal nerve; and it is here and here only that the nerve is exposed to injury. Hence one should have respect for this small triangular area and never bare the bone posterior to the ganglion.

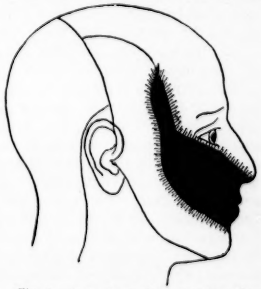

Fig. 2.—Area of anesthesia ten days after section of the middle fasciculi of the sensory root.

Now the question of most concern to the patient, misinformed as he so often is, has to do with vision. In the early days when total excision of the gasserian ganglion or total section of the sensory root were the routine operations, trophic keratitis was not an uncommon complication, troublesome at best, serious if neglected. But today trophic keratitis is no longer a menace, and the reader must not be misled by statements to the contrary.

It is clearly stated in my article of 1925 [4] that, since I had modified the technic to conserve the ophthalmic portion of the sensory root, keratitis was no longer a complication and when the article was written the modification had been practiced ten years, that is, since 1915. Despite the positive character of the statement, Dandy [7] referring to a paper by my associate, Dr. F. C.

4. Frazier (footnote 1, fifth reference).
5. Frazier and Whitehead (footnote 1).
6. Frazier (footnote 1, third reference).

7. Dandy, W. E.: An Operation for the Cure of Tic Douloureux: Partial Section of the Sensory Root at the Pons, Arch. Surg. **18**: 687 (Feb.) 1929.

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Grant,[8] states that "with Frazier's subtotal radiculotomy, Grant gives the percentage of cases of keratitis as about 10." Dr. Grant wrote, "None of those cases in which the inner upper fasciculus of the root was saved showed any corneal complication." Dandy's statement is so at variance with the presented facts that I take this occasion to call the attention of the profession to the misquotation. Not only is it a matter of scientific interest, but if this impression should prevail among physicians and their patients, there would be needless concern and apprehension about a complication that no longer occurs.

Fig. 3.—Area of anesthesia seven days after section of the outer two thirds of the sensory root.

At a meeting of the Neurological Society at Baltimore, June 13, 1930, following Dandy's presentation of two patients recently operated on, there was an informal discussion and interchange of views as to the cerebellar approach for tic douloureux. While no corneal ulcer or even a suggestion of corneal injection had developed before the patients were discharged, nevertheless there were verbal reports of two corneal ulcers after discharge and one of total deafness on the side that had been operated on. Dandy corrected an earlier impression that, by cutting the outer half of the sensory root, objective pain sensation was lost and tactile sensation preserved. What he meant to say was this: that by cutting the outer half of the sensory root the subjective pain of trigeminal neuralgia was cured. In evaluating the relative merits of the accepted temporal route and the proposed cerebellar approach, these statements must be given consideration. Corneal ulcer, and damage to the auditory nerve and to the cerebellum with troublesome ataxia are possible even though occasional complications. But apart from these complications there seemed to be almost unanimity of opinion that the cerebellar approach, if accepted generally as a substitute for the temporal route, would inevitably be attended with a decidedly higher mortality. When dealing with an operation that is one of choice and not of necessity, so far as concerns life, the mortality rate will always be the deciding factor.

I shall not describe the technic of the operation step by step, as this may be found in a recent contribution,[9] but merely make some passing comments which those who perform the operation only occasionally may find helpful.

Often as I have performed the radical operation, I never approach one with any sense of assurance that it will be wholly without technical difficulties. Though operating in a field perfectly familiar in every detail, I find the greatest variation between one case and another. For example, in one case the dura may be unusually thin and so plastered to the skull that it seems impossible to separate it, especially in the temporal region, without penetrating it in more places than one. This is not a matter of great moment but it is exceedingly annoying. In the next case one may easily separate the dura and only a moment or two passes before arriving at the foramen spinosum. In one case the course of the posterior branch of the middle meningeal artery is so low that it may be torn as one makes the initial perforation of the skull. In some cases, especially in the dolichocephalic skull, the middle fossa is deeper and the ganglion relatively far forward. It is a good plan always to make a perforation in the dura as soon as the cranial opening is made to allow the cerebrospinal fluid to escape. This facilitates the elevation of the temporal lobe, especially in those cases in which there is an unusual amount of fluid in the subarachnoid space, and it is surprising how the amount varies.

After he has plugged the foramen spinosum with cotton, and cut the middle meningeal artery and vein—and there is no easier or safer way of controlling hemorrhage from this source than by plugging the foramen—the operator will find it helpful to chisel the small bony eminence that lies just lateral to the foramen ovale. This bony process may be a tiny spicule, a dome-like process, or a ridge. By chiseling it away at once the foramen ovale is exposed to view and this is of great assistance in the presence of a deep temporal fossa. This process is also a sure guide to the location of the foramen, the site of which must be determined before one knows where to look for the cleavage between the dura and the ganglion.

Again, the facility with which the dura may be separated from the ganglion sheath varies greatly. It seems to me sometimes as though there had been a basilar meningitis at some time which not only bound these structures firmly together but extended to the arachnoid and root. Instead of the root lying freely in the subarachnoid space with its several fasciculi easily separated one from the other, arachnoid and fasciculi are more or less fused together and the tissues vascularized, as they are not in the average case.

Fig. 4.—Area of anesthesia five days after section of the ophthalmic portion of the sensory root in a patient with pain limited to the ophthalmic division.

As the technic prescribes, the operator begins at the foramen ovale to uncover the ganglion and continues as far forward as the point where the maxillary division is given off, and then inward until he can see the pulsating bluish arachnoid, beneath which the sensory root lies. This is the goal. Once the smallest area of ganglion is exposed, I inject a 1 per cent solution of procaine hydrochloride, and the ether is discontinued. From conversations and consultations with many patients I have long been convinced that the patient prefers a general anesthetic and, if the ether is discontinued at this time, the patient is conscious when the wound is closed and has been spared the apprehension of pain, which, by virtue of years of suffering, these patients dread so greatly. I think I know the psychology of the "tic" patient from every angle.

8. Grant, F. C.: M. J. & Rec. **121**: 206 (Feb. 18) 1925.
9. Frazier, C. H., and Gardner, W. J.: Surg. Gynec. Obst. **47**: 73 (July) 1928.

One often finds an operator resorting to certain helpful dodges that are not prescribed in the technic. Here is one: If there is any tendency to oozing as the ganglion is being uncovered, the ganglion may be injected forcefully with physiologic solution of sodium chloride. This creates an ischemia which makes the field practically bloodless.

A T-shaped incision through the arachnoid uncovers the root, and how the root is to be dealt with depends on the distribution of pain. First of all, let me remind the reader of certain facts relative to the sensory root. In 1901 Spiller [3] was able to show, from his examination of the sensory root of dogs after incomplete section, that the nerve fibers of the sensory root in both its intracerebral and extracerebral portions maintain the same relative positions throughout the course of the root; and if this is true of the dog, presumably it is true of man. In collaboration with Whitehead,[5] I established the fact by studies of the embryo that there were anatomic divisions of the ganglion as there were of the sensory root. And phylogenetically it is known that in lower forms of life the ophthalmic portion of the trigeminal system has its independent ganglion and is entirely separate from the mandibular and maxillary portions. These facts of experimental, embryologic and phylogenetic origin, plus the clinical exemption of the ophthalmic division as a primary seat of pain in 95 per cent of the cases, furnish the foundation of the subtotal and selective method of dealing with the root.

At first, in 1901, I sectioned the entire root as routine; in 1915, as a routine procedure, I cut the outer two thirds (subtotal section), but since then I have been governed by the distribution of the pain, cutting that portion of the root corresponding to the first, second or third division, according to the pain distribution. Stookey [10] refers to this modification of technic as differential section. Now it should be understood that one cannot recognize the precise number of fasciculi in the root that supply each anatomic division of the ganglion, but if one leaves just two fasciculi for any one of the subdivisions these will suffice for purposes of innervation. In the next but last operation I sectioned only what corresponded to the ophthalmic portion of the root, and sensation was conserved in the maxillary and mandibular distributions (figs. 1, 2, 3 and 4).

The motor root, as I have said, is conserved. Its recognition is not difficult if one elevates the sensory root as a preliminary procedure. As the motor root lies behind the inner half of the sensory root there is no reason why the outer third should not be first sectioned. It should be remembered that the motor root, while usually represented by a single fasciculus, sometimes is composed of two fasciculi. If not aware of this anatomic fact, one may section one of the motor fasciculi, mistaking it for a part of the sensory root. It should be remembered, too, that if the suction cannula approaches too near the motor fasciculus, the root will be avulsed by the suction. This has happened in my experience in the hands of an untrained assistant.

When through with the sensory root resection, as prescribed by the individual case, there remains only, before the wound is closed, control of bleeding from every source. For this purpose two silver clips are applied, one to the peripheral stump of each of the two branches of the middle meningeal artery. There may be and often is oozing from a dural vein or sinus at the point at which the dura is reflected over the maxillary division. A tiny muscle graft will control bleeding from this source perfectly. A second oozing point may be found where the dura is detached from the petrous bone and a third where the anterior branch of the middle meningeal artery is separated from the skull. Muscle grafts suffice for these two. The wound is then closed with tier sutures.

The postoperative care of the patient requires no especial instructions. On the second or third day a herpetic eruption may appear on the face and buccal cavity and oddly enough usually in the distribution of the maxillary division. The patient will be out of bed on the fifth day and is ready to leave the hospital on the seventh.

I have presumed to submit this contribution, supplemental to previous articles, chiefly in the interest of the patient. There are still too many patients who, for lack of disseminated information, continue unrelieved for too many years.

133 South Thirty-Sixth Street.

10. Stookey, Byron: Ann. Surg. **87**: 172 (Feb.) 1928.

TREATMENT OF TRIGEMINAL NEURALGIA WITH TRICHLORETHYLENE

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LOS ANGELES

Trichlorethylene, a strong, sweet smelling white liquid, was used in Germany during the Great War for removing grease from the metal parts of machinery and was also contained in a varnish used to cover the supporting surfaces of airplanes. Plessner,[1] in 1915, presented before the Berlin Medical Society four workers suffering from the chronic effects of an acute poisoning. A study of these workers showed that they were exposed to trichlorethylene, and it was to this drug that these symptoms were attributed. Immediately following the exposure to this drug, these men developed vertigo, nausea, vomiting, swelling of the optic disks and bilateral anesthesia of the trigeminal area, without motor involvement. Within a few weeks, these acute symptoms subsided. At the time of Plessner's presentation, eight months had elapsed since their exposure. Clinically these men had a bilateral loss of sensation definitely confined to the trigeminal distribution of the face; taste was lost in the anterior two thirds of the tongue to sweet, sour and salt, but they were able to distinguish bitter. The corneal reflex was absent in two men, diminished in one and undisturbed in the other. None of these men demonstrated any paralysis of the muscles of mastication, which indicated a specificity of the drug for the sensory portion of the trigeminal tract.

Oppenheim, who was present at this meeting, suggested that this drug would be invaluable in the treatment of trigeminal neuralgia.

Joachimoglu,[2] investigating the pharmacology of trichlorethylene, clearly proved by animal experimentation that the drug was not irritating to the mucous membrane of the respiratory tract, did not hemolize the blood, and did not cause fatty degeneration of the liver. Although this drug belonged to the same group to which chloroform belongs, it did not carry any of the harmful properties of the latter. Joachimoglu believed the drug could be used with perfect safety in industry.

1. Plessner, W.: Ueber Trigeminuserkrankung infolge von Trichloräthylensvergiftung, Klin. Wchnschr. **53**: 25 (Jan. 3) 1916.
2. Joachimoglu, G.: Die Pharmakologie des Trichloräthylens (Chlorylen Kahlbaum), Klin. Wchnschr. **58**: 147, 1921.

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Following the advice of Oppenheim, Plessner began the use of the drug in the treatment of trigeminal neuralgia, using the inhalation method. After many clinical trials, he came to the conclusion that from 3 to 60 drops could be used three times a day by inhalation without toxic effects, and that from 20 to 30 drops inhaled three times a day would be sufficient to produce complete relief.

In 1916, Plessner [3] reported fourteen cases of trigeminal neuralgia treated with trichlorethylene. Of these fourteen cases, twelve were completely relieved and two were unaffected. This first series gave the remarkable result of 85 per cent cured, and it appeared as if a medical specific had been reached for trigeminal neuralgia. However, the later reports of cases did not measure up to the expectations of Plessner. Since the original paper, 163 additional cases of trigeminal neuralgia treated with this drug have been reported, 15 of which are included in the present paper. With Plessner's original cases, the total proportion of complete relief is 25 per cent. Exclusive of his report, the total proportion of complete relief is 15 per cent. As the proportion of complete relief reported by Plessner has not been obtained by other investigators, probably 15 per cent more nearly represents the actual facts. Approximately a further 52 per cent have had partial relief from pain.

From this statistical study it may readily be seen that trichlorethylene, though not giving the original spectacular result, is an extremely valuable adjunct in the treatment of trigeminal neuralgia, provided one is cognizant of its limitations. In addition to these patients with complete relief of pain (15 per cent), this drug has proved quite valuable in the amelioration of symptoms. In the reported cases 51 per cent have had their attacks diminished as to both intensity and frequency. Many of these patients have preferred these occasional mild attacks rather than undergo the even small risk of surgery or have the discomforting effects of anesthesia. In the two included cases in which pain was relieved, one patient had attacks four or five times a day. After two weeks of trichlorethylene therapy, the attacks of pain occurred at intervals of two weeks and were of such mild character that the patient preferred this pain to the anesthesia that resulted from her former alcohol injections. The other patient, a public speaker, developed such severe attacks during his orations that he was frequently forced to stop. After three weeks of trichlorethylene therapy, his attacks became so mild that even if they occurred during a speech he was able to continue. In addition, the frequency of the attacks was greatly lessened.

The question of corneal anesthesia has brought up numerous diversified opinions. Hildsheiner [4] obtained corneal anesthesia in the majority of cases of non-trigeminal neuralgia, and for this reason recommended the drug in eye diseases. Rohrschneider did not obtain any corneal anesthesia, while Plessner in his original report obtained anesthesia in two out of his four cases. Blumenthal [5] believed that this drug could be used in vasomotor disturbances of the face, and in vasomotor rhinitis. It was his opinion that the drug acted directly on the sympathetic fibers, and that the cure was dependent on the presence of sympathetic fibers.

For the treatment of trigeminal neuralgia, the drug should be inhaled three or four times a day, from 20 to 25 drops being placed on a piece of gauze. The inhalation should be continued until the odor has entirely disappeared. This should be carried out over a period of a month to six weeks before its use is discontinued. The drug occasionally produces vertigo, sleep and drowsiness, and therefore it is well to take the inhalation in a recumbent position. After the pain is relieved, it is not necessary to continue the inhalation of the drug daily. As a prophylactic measure, it is extremely wise to inhale this drug every two or three months for a period of three consecutive days. Occasionally the patient may complain of a tingling sensation in the extremities which, however, passes off rapidly. Oljenick [6] reported a man who began to shriek and sing following inhalation. The best results have been reported in cases of short duration and those involving the mandibular division. Seelert [7] was of the opinion that trichlorethylene should be given by mouth in gelatin capsules in a dosage of 0.25 Gm. two or three times a day. Bendzulla [8] believed that its therapeutic results were obtained more efficiently and more rapidly by inhalation than if given by mouth.

Cases Treated With Trichlorethylene

Author	Number Treated	Completely Relieved: Number	Completely Relieved: Per Cent	Partially Relieved: Number	Partially Relieved: Per Cent	Unaffected
Plessner, W.: Klin. Wchnschr. **53**: 25 (Jan. 3) 1916; Monatschr. f. Psychiat. u. Neurol. **39**: 129, 1916; Klin. Wchnschr. **53**: 514 (May 8) 1916	14	12	85	0	0	2
Kramer, Franz: Klin. Wchnschr. **58**: 140, 1921	58	7	11.9	39	66.3	12
Magunna, Kurt: Klin. Wchnschr. **1**: 618 (March 25) 1922	20	5	25	6	30	9
Seelert: Klin. Wchnschr. **1**: 2228 (Nov. 4) 1922	19	1	5.5	14	74	4
Oljenick, I.: Neurotherapie, Bijblad der Psychiat. en Neurol. Bl. **6**: 1, 1924	20	3	15	14	70	3
De Busscher: J. de neurol. et de psychiat. **29**: 97 (Feb.) 1929	31	6	19	17	52	18
Glaser, M. A.: Present paper	15	2	13.3	2	13.3	11
Total number of cases treated						177
Percentage of cases completely relieved, including Plessner's						25
Percentage of cases completely relieved, excluding Plessner's						15
Percentage of cases partially relieved, including Plessner's						44
Percentage of cases partially relieved, excluding Plessner's						51

In the original cases reported by Plessner, wherein the toxic effects were noted, trigeminal anesthesia was present. It was this one point of trigeminal anesthesia that led to the use of this drug in the treatment of trigeminal neuralgia. In contradistinction to these original observations, none of these patients inhaling this drug developed any trigeminal anesthesia, even if the pain was relieved. The question of the corneal reflex is still debated. In the fifteen cases reported in this paper, no anesthesia was present, nor was the corneal reflex diminished. This was true for the two patients cured and the two relieved, as well as for those that were entirely unaffected. Had this drug produced complete bilateral anesthesia of the trigeminal distribution, its value for the cure of trigeminal neuralgia would

3. Plessner, W.: Die Erkrankungen des Trigeminus durch Trichloräthylenvergiftung, Monatschr. f. Psychiat. u. Neurol. **39**: 129, 1916; Vorläufige Mitteilung über Behandlungsversuche der Trigeminus neuralgie mit Trichloräthylen, Klin. Wchnschr. **53**: 514 (May 8) 1916; Ueber Behandlungsversuche der Trigeminusneuralgie mit Trichloräthylen, Monatschr. f. Psychiat. u. Neurol. **44**: 374, 1918.

4. Hildsheiner, S.: Ueber die Wirkung des Chlorylens (Kahlbaum) auf die normale und entzündlich veranderte Hornhaut des Menschen, Deutsche med. Wchnschr. **47**: 748-749, 1921.

5. Blumenthal, Fritz: Ueber Chlorylen, Deutsche med. Wchnschr. **50**: 140 (Feb. 1) 1924.

6. Oljenick, I.: Treatment of Trigeminusneuralgia by Chlorylen "Kahlbaum," Neurotherapie, Bijblad der Psychiat. en Neurol. Bl. **6**: 1, 1924; Trigeminusneuralgie en andere aanzeichtspijnen, Nederl. Tijdschr. v. Geneesk. **1**: 812 (Feb. 5) 1927.

7. Seelert: Interne Anwendung des Chlorylen (Trichloräthylen) bei Trigeminusneuraigie, Klin. Wchnschr. **1**: 2228 (Nov. 4) 1922.

8. Bendzulla: Die Behandlung der Trigeminusneuralgie mit Chlorylen, Aerztl. Rundschau **37**: 21 (Jan. 25) 1927.

have been questionable. Such a resulting bilateral anesthesia would have been more discomforting than the original disease, and therefore surgical measures wherein only partial anesthesia of the trigeminal tract could be accomplished would have been the method of choice. As the situation exists at present, a patient cured of trigeminal neuralgia by the use of trichlorethylene has a greater advantage over a surgical cure in that he is free from pain without the resulting anesthesia. The discrepancy existing between the anesthesia occurring in the original workers reported by Plessner and the relief of pain without demonstrable facial anesthesia has led many of the writers, such as von Kalinowsky [9] and Bab, to raise the question whether or not trichlorethylene was the drug responsible for the anesthesia and toxic symptoms reported by Plessner. It has also brought up the point whether trichlorethylene is a specific for the trigeminal tract or whether it acts as a narcotic, depressing the cortex to painful stimuli. These questions are rightly raised. It certainly appears as if the present trichlorethylene is not the drug responsible for the toxic symptoms in Plessner's workers. How it acts on the trigeminal tract is still an unsolved problem.

I have had occasion to try the drug in atypical facial neuralgia and in sphenopalatine and allergic neuralgia, without obtaining any relief from pain. These observations do not favor the cerebral depressant theory.

Trigeminal neuralgia was first recognized by Avicenna in A. D. 1000 and was later described by Schlichtung in 1748. Nicholas Andre, in 1756, for the first time called it "tic douloureux." Fothergill, in 1773, was the first to describe the disease accurately, and little can be added to his original description. The diagnosis of trigeminal neuralgia is usually clear cut. The disease consists of superficial, sharp, acute, lancinating pain, almost always unilateral and confined to the distribution of the trigeminal tract. This pain usually lasts two or three seconds but occasionally is prolonged to even half an hour with absolute freedom of the severe pain between attacks, with occasionally a feeling of discomfort or soreness in the interim. Frequently there are trigger zones, these being areas which, on being touched, will set off the paroxysm of pain. The pain is never cured spontaneously nor can it be relieved by the usual symptomatic treatment. However, there are frequently remissions when the pain is absent for from several months to several years, only to return with more intensity. The etiology of trigeminal neuralgia is unknown, and the attacks may be precipitated by local contact or may occur spontaneously.

A disease which closely simulates trigeminal neuralgia, but which on careful analysis [10] demonstrated many diagnostic differences, is that of "atypical" facial neuralgia. Before this disease was first recognized, the pain was considered that of the trigeminal neuralgia and the patients were subjected to the usual surgical procedure of the neuralgia patients. However, in spite of the anesthesias so obtained, the patients still retained their pain. For want of a better term, this pain was called "atypical facial neuralgia." The pain in this disease is deep seated, deep in the bone, or deep in the muscle, continuous and of tearing, bursting, nagging, gnawing nature. The patients have great difficulty in describing the character of the pain, and in a series of 143 cases, 73 different adjectives were used. The pain goes beyond the bounds of the trigeminal tract, extending into the cervical region and occasionally down the arm. It is bilateral in about one third of the cases and has associated with the pain sympathetic phenomena, such as lacrimation, edema of the face, congestion of the conjunctiva and flushing of the face. The pain is essentially persistent and continuous. There are, however, periods of greater severity. During the first two or three hours of this aggravated period, the pain greatly increases until a height is reached, after which the intensity slowly subsides until the end of the third day or so, when the chronic phase is resumed. There are many variations from this typical history. There may even be remissions lasting from two to three years.

In addition to atypical facial neuralgia, sphenopalatine neuralgia, neuralgia of the seventh, ninth and tenth cranial nerves, dental pulp stones or allergic headaches should not be confused with true trigeminal neuralgia.

The treatment of trigeminal neuralgia is one of surgical advances and progress. It carries with it the names of Rose, Hartley, Tiffany, Krause, Horsley, Doyen, Spiller, Frazier, Cushing, Dandy and Adson. The first surgery was the removal of the gasserian ganglion by Rose in 1891. He also suggested preservation of the ophthalmic division. Horsley, in 1891, attempted to cut the sensory root of the trigeminal nerve without success. In 1893 the Hartley-Krause operation was introduced. In 1901 Frazier and Spiller reported the first successful intracranial section of the sensory root. In 1896 Tiffany suggested the partial section of the gasserian ganglion, and also the saving of the motor root. In 1917 Frazier, after morphologic studies of the gasserian ganglion, and at the suggestion of Spiller, carried out the subtotal section of the sensory root. In 1919 Frazier found that it was possible to preserve the motor root. In 1922 Adson suggested the technic of preserving the motor root by exposure from the medial side by gentle traction and elevation of the sensory root. The introduction of the subtotal section eliminated one of the horrifying sequelae that frequently followed the complete section of the sensory root. By the preservation of the ophthalmic division, corneal ulcers could not occur; the preservation of the motor root maintained the motor supply to the muscles of mastication, prevented atrophy of these muscles, and if perchance bilateral trigeminal neuralgia should occur, muscular paralysis need not be feared.

In 1929 Dandy introduced section of the sensory root at the pons and considered this superior to the temporal route. He claimed many advantages by this section from that of the temporal route—mainly the preservation of the motor root, the absence of postoperative corneal anesthesia, the larger area of remaining sensation, and the retention of the sense of touch. These advantages are disputed by Gotten, Fay and Grant.[11]

Alcohol injection of the branches of the trigeminal nerve was carried out by Schlosser in 1903, by Levy and Baudouin in 1906 and by Patrick in 1907. Harris in 1912 injected the gasserian ganglion. Treatment by alcohol is only palliative and is of value in patients who are poor operative risks, or in those who are being prepared for the radical procedure. The average duration of relief is about nine months, but occasionally relief is for two to three years.

9. Von Kalinowsky, L.: Bemerkungen zur Therapie mit Chlorylen (Trichlorathylen), Ztschr. f. Augenh. **63**: 367 (Dec.) 1927.
10. Glaser, M. A.: Atypical Neuralgia, So-Called, Arch. Neurol. & Psychiat. **20**: 537-558 (Sept.) 1928.
11. Gotten, Nicholas; Fay, Temple; and Grant, F. C.: A Case of Section of the Trigeminal and Glossopharyngeal Nerves Through the Posterior Fossa (Dandy Method), Arch. Neurol. & Psychiat. **23**: 393 (Feb.) 1930.

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When the diagnosis of trigeminal neuralgia is definitely ascertained, it would be prudent to try trichlorethylene with the hope that the patient may be among the small percentage so ideally relieved. If this method fails to relieve pain, alcohol injection or surgery should be carried out. It might be well to explain the palliative action of alcohol and the permanence of the surgical treatment. As the operative mortality is only 0.37 per cent, surgery may be safely advised. It is usually found that the patients will first choose the alcohol injection and then with the recurrence of the pain resort to the operative treatment.

REPORT OF CASES

CASE 1.—R. K., a man, aged 56, complained of pain in the left upper and lower gums. He had had all teeth extracted. He had had hypertension with cardiac hypertrophy and angina pectoris for the past several years. About seven months before, he developed attacks of shooting pains in his upper and lower jaws, confined particularly to the inside of his mouth. For several months these attacks had occurred about twenty times a day. They were usually brought on by talking, occasionally coming on without any cause. Often rubbing the gums relieved them. The attacks were not of great severity and did not have the appearance of the extremely severe usual trigeminal pain. Roentgenograms of the jaws are entirely negative. Two weeks' therapy with trichlorethylene proved of no avail. Because this pain did not particularly incapacitate the patient, it was deemed wise to block the mandibular and maxillary nerve with procaine hydrochloride. For six hours following this block he was entirely free from pain. The numbness, however, caused him such disturbance that he stated that the pain was much less annoying. For this reason an alcohol injection was not carried out.

This is an extremely unusual case of trigeminal neuralgia and differs greatly from the usual type of cases. However, with this marked relief of pain following nerve block, it is apparent that the diagnosis of trigeminal neuralgia must be made.

CASE 2.—H. C. R., a man, aged 71, complained of right sided facial pain. His teeth had been extracted. About nine years before I saw him, the patient began to have pain in a molar tooth in the right lower jaw. He had several teeth extracted without relief. This pain was of a shooting, sharp, lightning-like character and confined to the right lower jaw. It was brought on by talking, eating or contact. The attacks lasted about one minute and he was free from pain in the intervals. The attacks occurred twenty or thirty times a day. He had eight previous alcohol injections in another clinic. Trichlorethylene did not relieve the pain. Alcohol injection relieved the pain.

CASE 3.—T. H., a man, aged 73, complained of right supra-orbital pain. His family history and past history were essentially negative. Four years before, he developed severe supra-orbital pain, which occurred in attacks lasting a few seconds and were of extreme severity. The pain was of a shooting, lightning, tearing character and occurred every few minutes. Between attacks he was entirely free from pain. Trichlorethylene did not prove of value. Evulsion of the supra-orbital nerve relieved the pain.

CASE 4.—N. T., a woman, aged 51, had right sided facial pain. All her teeth had been extracted. For the past seven years she had had pain on the right side of her face, involving the third division of the trigeminal nerve. This pain occurred in attacks lasting two or three minutes and was of a sharp, lightning, lancinating character. Between the attacks she was entirely free from pain. She had had numerous alcohol injections and finally it appeared as if injections would not relieve her pain. Trichlorethylene therapy was tried, but it did not relieve the pain. Alcohol injection of the third division was attempted without results. A subtotal section of the trigeminal nerve was performed with a relief of symptoms.

CASE 5.—J. B., a man, aged 78, complained of left sided facial pain. His family history and past history were essentially negative. About fifteen years before, he developed severe pain in all divisions of the left trigeminal nerve. During varying periods of time he was pain-free. About eighteen months before, the pain returned with extreme severity. It was of a sharp, knifelike character, occurring in attacks from thirty to forty times a day and lasting two or three seconds; he was free from pain between attacks. The attacks were so severe that the patient could scarcely eat, was confined to bed, and was slowly losing weight. He had six alcohol injections in other clinics, the last two proving unsatisfactory. Treatment with trichlorethylene proved of no value. Alcohol injection did not prove satisfactory. He refused surgery.

CASE 6.—H. K. S., a woman, aged 78, complained of pain on the right side of the face. About twenty years before, the patient noticed the onset of attacks of acute, lancinating pain in the right second and third divisions of her face. These attacks lasted about half a minute and were of extreme severity. During the interim, she was entirely free from pain. For the past two years the attacks had occurred in increasing frequency and in the past six months occurred from ten to twenty times a day. There was a definite trigger zone along the border of the nose, and the attacks were accentuated by touch or by eating. Treatment with trichlorethylene was tried but proved of no value. Alcohol injection of the second and third divisions relieved the pain.

CASE 7.—A. L. S., a woman, aged 70, complained of left sided facial pain. She had previously had chiropractic and electrical treatment. For the past six years the patient had had attacks of severe, sharp, shooting pain on the left side of her face, involving the second and third divisions. In the past year or so, this pain occurred about fifteen times a day and in the interim she was entirely pain-free. Alcohol injections relieved her for the past six months. Trichlorethylene did not relieve her pain. An alcohol injection of the second and third divisions proved satisfactory.

CASE 8.—F. L., a woman, aged 77, complained of pain on the right side of the face. On account of the extreme pain, the patient had become addicted to the use of morphine. By sheer will power following the relief of her pain, she controlled this habit and for the past eight months had not used any morphine. She had had pain in the face for about forty years, the attacks occurring during three or four consecutive years, and occasionally being absent for several years. About nine months before, the pain became extremely severe and occurred practically every day. The pain was gnawing, shooting and knifelike in character; it occurred in attacks lasting about half a minute and brought on by contact or eating. They involved the right second and third divisions. Treatment with trichlorethylene proved of no avail. Alcohol injection of the second division gave relief that has lasted fourteen months; whereas the relief in the third division lasted eight months. The latter was reinjected with the relief of pain.

Morphine addiction in trigeminal neuralgia is a rarity. Frazier has never observed this in any of his series.

CASE 9.—A. B., a man, aged 76, suffered from pain in the face. All his teeth had been extracted. He had had attacks of severe, lancinating pain on the left side of his face for the last thirty years. During this period he had had an absence of pain frequently as long as one year. He would then have a period of severe attacks lasting a week, and he would thereafter be again pain-free. In the last year he had two of these severe periods; one, in which the pain was of extreme severity, lasted two weeks. He could not sleep nor eat, the attacks occurring every five minutes. At the end of the second week period, he again had a period during which he was free from pain. About five weeks before, he developed another period of extreme pain, lasting longer than any he had had. The pain involved the third division on the left side of his face and was of a sharp, knifelike character. It occurred spontaneously. Treatment with trichlorethylene proved of no avail. About a month after stopping the use of trichlorethylene his severe attacks subsided. He refused nerve injection or surgery.

CASE 10.—M. M., a man, aged 52, complained of pain in the left side of his face. His family history and past history were essentially negative. For the past seventeen years he

had had attacks of pain involving the left side of his face. These attacks were extremely severe and of a sharp, lancinating character; they would last a few seconds. There were periods lasting from six months to two years in which he did not have these acute attacks, and then he would have a period for several weeks in which the attacks were practically continuous. During these periods he could scarcely sleep and could not eat. He had had no treatment for this neuralgia other than sedatives. He was placed under trichlorethylene therapy without relief of symptoms. Alcohol injection was performed with complete relief.

CASE 11.—E. V. R., a woman, aged 60, complained of right sided facial pain. She had previously had chiropractic and electrical treatment; also, her teeth had been extracted. Off and on for the past year, the patient had had attacks of sharp, shooting, knifelike pain, situated in the area of the right second division. About eight months before, she had an alcohol injection (in another clinic) without relief of pain. Trichlorethylene therapy entirely relieved her pain after three days' administration. Repeated examination of the face failed to reveal any anesthesia; the corneal reflexes were not diminished, nor did the patient complain of any facial numbness.

CASE 12.—A. S., a man, aged 44, complained of pain in the face. He had had numerous teeth extracted, and had had a sinus operation. For the past seven years he had had acute attacks of pain, involving the right third division. These attacks would last two or three seconds and were of extreme severity. There were several months wherein he had periods during which the attacks would not occur; then they would occur consecutively in a week or so as often as fifty times a day. He had had previous alcohol injection at another clinic, with the relief of pain lasting from six to eighteen months. Trichlorethylene therapy was carried out without relief. Alcohol injection was successfully performed with relief of symptoms.

CASE 13.—C. M., a woman, aged 59, complained of pain in the right side of the face. She had had her teeth extracted and had had chiropractic treatment and electrical therapy. The first attack of pain was noticed seventeen years before. She was then free from pain for a period of four years. Alcohol injections from time to time relieved her pain for eighteen months, but the last injection gave her relief for only one month. This pain involved the third division slightly, but was more marked on the second division. Trichlorethylene therapy reduced her attacks, both in severity and in number. She preferred this relief of pain to a total relief which would involve the discomfort of anesthesia.

CASE 14.—E. B., a woman, aged 70, complained of pain on the right and left sides of the face. She had had all her teeth extracted and had had three sinus operations. Thirteen years before, she developed pain in the right third divisions; five years before, she developed attacks of acute, lancinating pain in the left second division, and that in the right only occurred occasionally. For the past eight months the pain had been most severe in the second and third divisions of the right side, with only occasional twinges in the left second division. For the past month the attacks had been extremely severe and had occurred from four to five times a day. After one week of trichlorethylene therapy, the pain was completely relieved.

This is an unusual case in that the patient had bilateral trigeminal neuralgia. Operation performed in this case would have been extremely destructive and would have necessitated loss of sensation to both sides of the face.

CASE 15.—J. M., a man, aged 55, complained of pain in the face. He had had several teeth extracted. About a year before, the patient developed pain in the left second and third divisions. These pains were of a sharp, lancinating character and of late had occurred three or four times a day, particularly when he talked. He had a definite trigger zone on the side of the nose. Trichlorethylene therapy relieved the pain so that he could continue with his work. The attacks were reduced in number and severity.

CONCLUSIONS

1. The result of a statistical summary shows that approximately 15 per cent of the reported cases of trigeminal neuralgia treated by trichlorethylene therapy were completely relieved of symptoms.

2. The percentage of partial relief varies with the different investigators. In the present series, 13.3 per cent were partially relieved; while in Seelert's series 74 per cent were partially relieved.

3. Trichlorethylene therapy is ideal in the treatment of trigeminal neuralgia in those cases in which the drug is effective, as the pain is relieved without a resulting anesthesia.

4. Trichlorethylene is not toxic.

5. The action of trichlorethylene in the relief of trigeminal neuralgia is unknown.

6. It is doubtful that trichlorethylene is the original drug responsible for the toxic symptoms and the anesthesia in Plessner's industrial workers.

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DETERMINATION OF THE VALUE OF ANTISEPTICS*

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It may safely be inferred that the use of antiseptics antedates the earliest existing record of mankind. The preservation of foods in times of plenty for the periods of scarcity was a lesson learned early by prehistoric races. They preserved their foods by dyeing, smoking, salting or spicing.

Spices, volatile oils, and balsams were early used by priests and healers in the care of wounds, although antisepsis was undreamed of. Later certain preparations of mercury and other heavy metals came into common usage. Distilled liquors, potions made from herbs, and even the cautery were listed in the armamentarium of our forebears devoted to the healing of wounds.

Throughout the ages, and until the work of Lister in the latter third of the nineteenth century, the term "antiseptic," however, was associated exclusively with the preservation of foodstuffs. Following his epoch-making discoveries, new and different terms with distinct meanings came into being. Today their use is largely academic. The average physician and surgeon use interchangeably, "antiseptic," "germicide," "disinfectant," and "bacteriostatic."

However, a definition of antiseptics that is most widely accepted at present, and the one recognized by the Department of Agriculture in Washington, was formulated by Reddish.[1] It is as follows:

> Antiseptics are substances which, when applied to microorganisms, will render them innocuous either by actually killing them or preventing their growth according to the character of the preparation or the method of application.

From time to time, new preparations with variable bactericidal properties have been produced. This gave rise to a need for evaluating their comparative efficiency. Of the many methods of evaluation suggested, three with modifications are widely accepted today. Of these

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1. Reddish, G. F.: Antiseptics, J. Am. Pharm. A. **16**: 501-502, 1927.

the Hygienic Laboratory[2] and the Rideal-Walker[3] procedures are in most common use. The *Lancet*[4] method is less widely used, especially in this country.

The general principles of the foregoing methods, all devised about two decades ago, are essentially similar. They have individual and common faults, which have become especially evident within the past few years. It becomes obvious to any one working on the subject of antiseptics, from either the practical or the theoretical point of view, that changes in the present technic of evaluating antiseptics are urgent.

The disinfectants in common use at the time these methods were developed were closely allied chemically. They were phenols or derivatives of phenol having, with slight modification, essentially the same properties. Hence it was possible, both theoretically and practically, to compare directly one with the other, using the same single organism for the test. One of the inherent weaknesses of these methods of comparison, the use of a single organism, was less serious at the time of their inception than it is now. Then there was a great need for disinfectants to control epidemics, especially of typhoid. Hence the bacillus of this disease was selected as the test organism for the work. If the variety and cultural characteristics of the bacteria responsible for the infections workers were then seeking to control had been appreciated, some other organism more hardy than *Bacillus typhosus* probably would have been selected as the test organism.

It should be remembered that the methods of testing disinfectants were devised at that time for a purpose quite different from our present needs. The disinfection of inanimate objects contaminated with disease-producing germs was the primary need for the different preparations. Today we are largely concerned with the sterilization of wounds, or the preparation of skin surfaces as germ free as is possible to produce without destruction of tissue. Briefly, then the original methods were devised to compare disinfectants, while our need today is for a system for comparing antiseptics intended for use on living tissues.

The antiseptics of today are no longer simple phenol preparations but include a diverse assortment of alcoholic preparations, heavy metals, complex organic derivatives, dyes and halogens. Their individual bactericidal properties differ in various ways, and their action in clinical dilution depends on a complex group of factors, chief of which might be properly considered the organism with which they come into contact.

In a comparative analysis of the efficacy of antiseptics there are many factors, theoretical as well as practical, to be considered. Of prime importance is the resistance of the different bacteria to the killing action of the preparation in a dilution suitable for clinical use. One antiseptic preparation may kill *B. typhosus* in high dilution and be totally innocuous to staphylococci in the same concentration, as determined by the Rideal-Walker or the Hygienic Laboratory methods; and precisely the reverse may be true as well.[5] Such information, in terms of the phenol coefficient describing the efficiency of the antiseptic, is not strictly in keeping with clinical results. Hydrogen peroxide, for instance, readily killed *Bacillus typhosus*, spared *Bacillus subtilis* (a spore former), was moderately efficient in inhibiting *Bacillus pyocyaneus*, and was a slighter better bacteriostatic agent for *Staphylococcus aureus*. The statement, therefore, that hydrogen dioxide (which was selected at random[6]) is an efficient antiseptic because it destroys *Bacillus typhosus* expeditiously is, as a matter of fact, misleading. It is efficient according to the technic used for *Bacillus typhosus* only. Such an example, however, is illustrative of the situation existing today in connection with antiseptics in general. The resistance of different organisms, representative of bacterial groups and under a variety of conditions, to a new antiseptic is usually not even determined before it is put on the market. Furthermore, it is evident that bacteria are not free and isolated in a wound but are intimately associated with the tissues, invading them and often freely intermixed with debris so that they are not readily accessible to the action of the antiseptics. Certain types of bacteria (spore formers) possess a unique protective mechanism which disappears under favorable conditions but retains for the organism its vitality in the presence of deleterious agents. Organisms may develop a fastness to different antiseptics, so that they may even grow in the presence of the product which formerly killed them.[7] There are other preparations that are rendered practically inert on contact with organic matter, so that their action is expended chemically in reacting with the tissues to a greater extent than with the organisms. To overcome these factors without sacrificing the clinical value of the product is still an unsolved problem. However, progress is resulting from the research directed at attaining a reliable antiseptic, germicidal in clinical dilutions, nontoxic, nonirritating, noncorrosive and rapidly efficient.

It is highly desirable that a standard technic for determining the efficiency of an antiseptic under a variety of conditions and using several organisms typifying as nearly as possible the several classes of invaders be adopted. Reddish[8] says:

> Phenol coefficients could still be used by the manufacturer for controlling the uniformity of his products, but the dilutions of these products which are specified for actual use must be based on definite tests against the organism it is desired to kill. Antiseptics for use on the skin and mucous membranes, and in cuts, abrasions, wounds, etc., should be tested against pyogenic organisms, such as *Staphylococcus aureus* and *Streptococcus hemolyticus*. If a disinfectant is recommended for general use, the manufacturer must be sure that the dilutions specified for his product will kill all of the nonsporing organisms which cause diseases of an epidemiologic nature. If he so desires he may recommend only one dilution for general use, but he must be certain by actual tests that this dilution will kill those organisms that are dangerous from an epidemiological standpoint. . . Further, since liquid antiseptics as ordinarily used on the animal and human body are intended to prevent infection by killing pathogenic organisms, especially the pyogenic group, or to aid in curing such infections if they have already started, the organisms used for testing their suitability for this purpose should be the ones that are actually met with in practice. It is obvious that the ability of an antiseptic to kill *Bacillus typhosus*, the test organism used in our standard phenol coefficient tests, is of little value in determining its germicidal efficiency against the organisms causing infections. A phenol coefficient of an antiseptic is naturally of little value to the medical profession and the layman in making a choice from the large number of germicides available.

2. Anderson, J. F., and McClintic, T. B.: A Method for the Bacteriological Standardization of Disinfectants, J. Infect. Dis. **8**: 1-26, 1911.
3. Rideal, S., and Walker, J. T. A.: Standardized of Disinfectants, J. Roy. San. Inst. **24**: 424, 1903.
4. Lancet Commission Report on the Standardization of Disinfectants: Lancet **177**: 4498, 4499, 4500, 1909.
5. Reddish, G. F.: Examination of Disinfectants, Am. J. Pub. Health **17**: 320 (April) 1927.
6. Allen, A. W.: A Comparative Study of the Bactericidal Values of Twenty-One Commonly Used Antiseptics, Arch. Surg. **19**: 512 (Sept.) 1929.
7. Meader, P. D., and Feirer, W. A.: Drug Fastness in Its Relation to the Resistance of Certain Organisms Toward Formalin Germicides, J. Infect. Dis. **39**: 237 (Sept.) 1926.
8. Reddish, G. F.: Methods of Testing Antiseptics, J. Lab. & Clin. Med. **14**: 649 (April) 1929.

Among the chief objections to the present procedures, the following may be mentioned: In the method of the Hygienic Laboratory, the broth is too weak, and the hydrogen ion concentration is too high to support a vigorous growth. *Bacillus typhosus,* the test organism, may lose its resistance when grown in these mediums. There is too wide a range of latitude between the phenol dilution and the resistance of *Bacillus typhosus* to it, as determined by the time element. In the original protocol it is stated that the test is applicable only to "disinfectants chemically related to phenol which are to be used against organisms reacting similarly to the manner in which typhoid reacts and which are destructible within the time and temperature limits of this test." The usual understanding of the term "phenol coefficient" among manufacturers as well as laymen is that it indicates that the disinfectant is a certain number of times stronger than phenol against *all organisms.*

In addition to several of the foregoing objections, the Rideal-Walker test has two others of considerable importance. The effectiveness of many disinfectants does not change uniformly with the concentration, so that determination of the coefficient differs according to the concentrations of the disinfectant used. By definition, the Rideal-Walker coefficient expresses "strength or efficiency of disinfectants under test" which, in reality, indicates relative strength of disinfectants which will kill *Bacillus typhosus,* as compared with the dilution of phenol, which would kill the same organism under conditions as specified in the test.[5]

From the practical angle, many inadequacies are evident. No notice is taken of the practical application of the antiseptic, which is, in the final analysis, the sole reason for the existence of methods for testing it. The laboratory standard may be summed up in two words: killing time. The clinical applications are not considered. An antiseptic may be suitable for use on the skin, yet unsuited for the eye. Tissue reaction is neglected. A sloughing area needs different treatment than a clean wound. Certain preparations are used as irrigants, others for wet dressings or transient applications. No attention is given to the fact that one of many or even several different organisms may be present against which the antiseptic may have no bacteristatic action whatever. As far as laboratory procedure is concerned, therefore, with emphasis placed on killing time and the use of an irrelevant weak organism, the practitioner must rely on the trial and error method of evaluation of antiseptics for practical use. Unfortunately, however, there seems to be a great reticence about reporting the unfavorable results, so that the literature contains an unjustifiable preponderance of favorable reports.

Other comparative methods of testing have been suggested by workers from time to time, for a variety of purposes. While these methods may have been open to criticism, especially by those who adhere to the time-honored procedures, the evidence points overwhelmingly to the urgent need for a modern, more comprehensive technic for the comparative rating of antiseptics. The following references support this view: Tinker[9] and Sutton[10] have collected isolated reports from the literature showing the incidence of nonsterile skin cultures both deep and superficial, following various preoperative skin preparations. It has been suggested that cultures of the skin scrapings be used to determine the antiseptic efficiency. Weyrauch[11] made a comparative study of the phenol coefficient determination of several different antiseptics, using the same technic (the Rideal-Walker) with *Bacillus typhosus* and *Staphylococcus aureus.* The phenol coefficient determination based on the use of *Staphylococcus aureus* differed widely with each antiseptic from the same rating with the use of *Bacillus typhosus.* Reddish[12] and Weyrauch[11] and many others have urged the use of several different organisms in any procedure to be accepted. Hailer[13] showed the variation in the resistance of several different organisms to the bactericidal action of germicides when they were tested by the usual method and when they were suspended on threads of cotton and silk which had been immersed in cultures, in the antiseptic solution. By this method he emphasized the necessity of determining penetrability of the antiseptic. Himebaugh[14] has devised several ingenious experiments to determine irritability of antiseptics to tissue, a feature that should be carefully considered in evaluating antiseptics. Wright and Allen[15] in recent papers have shown the wide variation in bactericidal properties of several antiseptics in the presence of massive infection and superficial contamination. Branham[16] and others demonstrated the fact that antiseptics inhibit the fermentation of sugar by yeast and have urged that the inhibition of the yeast function be used as a guide to the bactericidal action of the different preparations. Richet[17] used the inhibition of lactic acid formation as an index of bacteriostatic action. Thus it is evident that there are many who regard a change in the present system as urgent.

In addition, the following purely practical ideas are offered for consideration:

Manufacturers cannot be held entirely responsible for the making of exorbitant claims for antiseptics which they produce if the standards of evaluation permissible are the methods of two decades ago and the antiseptics of today. The innocent victims of this unfortunate situation are: (*a*) the mass of the public, who have no choice but to believe what is stated plus what is inferred from the advertisements of these products; (*b*) physicians who are out of touch with the more critical scientific world and hence are in practically the same situation as the lay public in judging values of antiseptics; (*c*) even outstanding leaders in medicine and surgery who have not sufficient time nor equipment to carry on experimental work either in the laboratory or clinic, to determine for themselves the value of the antiseptics they may desire to use; they may be carried away by the names of a few of their colleagues, or institutions, or manufacturing chemists, whose temporary enthusiasm gives unwarranted support to new and inadequately tested products.

On the other hand, the physician or surgeon who uses the several available antiseptic products is often at fault

9. Tinker, M. B., and Sutton, H. B.: Inefficiency of Most of the Commonly Used Skin Antiseptics, J. A. M. A. **87:** 1347 (Oct. 23) 1928.

10. Sutton, H. B.: Inadequate Skin Preparation as a Cause of Postoperative Wound Infection, New York State J. Med. **28:** 129 (Feb.) 1928.

11. Weyrauch, F.: Comparative Tests of Disinfectants, Centralbl. f. Bakteriol. **103:** 123 (July 1) 1927.

12. Reddish, G. F. (footnote 5); Resistence to Phenol of Staphylococcus Aureus, Am. J. Pub. Health **15:** 534 (June) 1925; Determining Germicidal Efficiency of Disinfectants, Am. J. Pub. Health **16:** 283, 1920.

13. Hailer, E.: Comparative Methods of Testing and Determination of the Values of Disinfecting Agents, Deutsche med. Wchnschr. **47:** 1384, 1921.

14. Himebaugh, L. C.: Personal communication to the authors.

15. Wright, I. S.: Effects of Mercurochrome-220 Soluble on the Growth of Bacillus Pyocyaneus, Arch. Surg. **15:** 958 (Dec.) 1927. Allen, A. W., and Wright, I. S.: The Bactericidal Properties of the Solution S. T. 37 (Liquor Hexylresorcinolis 1:1,000), ibid. **17:** 834-839 (Nov.) 1928. Allen (footnote 6).

16. Branham, Sara E.: An Improved Technic for the Comparison of Antiseptics by Yeast Fermentation, J. Infect. Dis. **44:** 142, 1929.

17. Richet, C.: Experimental Research on Antiseptics, Médecine **1:** 719-721 (Sept.) 1920.

in his application of the preparation. This may be the cause of the many unfavorable results noted in connection with the use of some of the antiseptics in common usage today. He must first understand the dynamic pathologic condition at which his medication is directed. Even with the understanding of the problem at hand he may and often does do more harm by medication of the wound than all the germs present would do under ordinary circumstances. Through the use of too strong or too often repeated application of the antiseptic he may destroy normal living and reparative tissues, thereby producing delayed healing, an ulcerating area, an unnecessary slough, or even systemic reactions following the absorption of the toxic products of the tissue degeneration. An agent which inhibits or kills the bacteria present in the wound, but which does not destroy tissue or interfere with the natural defensive body mechanisms, is, generally speaking, far more desirable than one which kills all the organisms present and at the same time accomplishes the destruction of the tissues with which it comes into contact.

It is felt, therefore, that more comprehensive tests are imperative to determine the antiseptic value of a preparation under several different conditions. It is of prime importance that more than one organism be used, as Novy[18] pointed out some years ago. Especially should representatives of the pyogenic group be included, since antiseptics are most commonly directed against them. This point has been emphasized many times during the past ten years, and Reddish[5] finally formulated a procedure embodying this thought. He reported a comprehensive procedure to the Laboratory Section of the American Public Health Association in 1926 as the culmination of several years' work. His method eliminated many of the objectionable features of the prevailing modifications of the Hygienic Laboratory method and combined their good qualities so that a "phenol coefficient" could be determined with the use of several different organisms; namely, *Bacillus typhosus, Staphylococcus aureus, Corynebacterium diphtheriae, Mycobacterium tuberculosis, Diplococcus pneumoniae* and *Streptococcus hemolyticus*. By employing these organisms it is possible to ascertain the action of an antiseptic on organisms typical of the different groups of nonsporulating pathogens. This method is, therefore, superior to the older methods in which only one bacterium was used, one now rarely encountered in the clinical application of antiseptics. This procedure should be used as the first step in the determination of the value of an antiseptic. It will weed out many worthless preparations.

However, there are certain essential characteristics which antiseptics should possess and on which this method and all preceding methods give no information, such as (1) the penetrability of the antiseptic; (2) the action of the antiseptic in the presence of serum; (3) the action of the antiseptic in the presence of massive infection, and (4) the action of the antiseptic on living tissue. These points are adequately estimated by the following methods of testing antiseptics.

In 1924 Himebaugh devised a new method for the testing of antiseptics and germicides, designated as the agar cup plate method. Through the cooperation and kindness of Dr. Himebaugh we are enabled to include his method[8] in this paper, with several important modifications now published for the first time. After a tremendous amount of experimental work, involving many combinations of different percentages of agar, added nutrient mediums and blood serum, Dr. Himebaugh believes the formula presented here is the one best suited for all round purposes of this test. The object was to visualize in the laboratory the results that might be obtained when an antiseptic or germicide is applied to open cuts and wounds. For the purpose of representing as nearly as it is possible in the laboratory the colloidal-like body fluids and tissues, standard beef extract agar was selected, containing from 10 to 50 per cent normal blood serum. Although there may be defects in the selection of the mediums, it is believed that from the standpoint of food material, salts and blood serum the method is sufficiently accurate for the purpose of indicating the comparative value of antiseptics and germicides when applied to open cuts and wounds over short time periods as well as over long time periods of exposure. As the colloidal-like structure for the mediums, Himebaugh has found standard beef extract agar superior to gelatin. When the amount of blood serum used is 50 per cent by volume, the medium is double strength standard beef extract agar. From 1.5 to 2 per cent agar is capable of indicating to the greatest advantage differences in antiseptic and germicidal value. The test organism selected was a standardized culture of *Staphylococcus aureus*. The resistance of this organism to most germicidal agents is greater under laboratory conditions than that of most other non-spore-bearing pathogenic organisms. It is representative of the pus-producing type of organism encountered in open cuts and wounds.

The technic in running the test is as follows:[19]

Standard beef extract agar, 250 cc., in flasks is cooled to a point at which it will not cause coagulation of the blood serum. Blood serum is then added to make 10 per cent concentration. The flasks are immediately inoculated with a twenty-four hour broth culture of the test organism. The inoculation is made by first diluting the culture 1:20,000 and then adding 1 cc. of this dilution to the flasks of medium. Immediately after inoculation and mixing by careful rotating, 30 cc. of the inoculated mediums are then transferred to petri dishes. After the agar is allowed to cool and form a solid jelly, a disk having a diameter of 2 cm. is removed from the center of the petri dishes. The cup or depression thus formed is then sealed at the bottom with a few drops of liquid agar. Originally glass stoppers were used to produce the desired cup. This was found a bad practice, causing injury to the medium at the time the glass stopper is removed. A nickel-plated, specially sharpened cork-borer, sterilized in a free flame, has been found most efficient in easily removing the disk from the center of the agar plate. After the medium is allowed to cool and form a solid jelly, 0.5 cc. of the antiseptic or disinfectant to be tested is placed in the cup at the center of the petri dish. If the antiseptic is to be applied for only a short-time period in practice, the technic of the test is to remove the antiseptic by means of sterile filter paper after five, ten, fifteen or thirty minutes in the cup. If the method of application recommended indicates that the product would be in constant application with the tissues over a period of time, such as results in the application of wet dressings, antiseptic powders or ointments, the antiseptic or germicide is allowed to remain in the cup for a period of forty-eight hours. The petri dishes, after treatment with the antiseptic or after its removal from the cup or depression at the center, are incubated for a period of forty-eight hours at a temperature of 37 C., for the purpose of securing growth of any organisms not inhibited by the antiseptic or germicide. The results are tabulated in distances from the cup, showing no growth. A further test is then made to determine whether or not the action observed was inhibitive or germicidal. Small disks (0.1 cc.) are removed from the mediums at distances of 0.1 cm. each, until the area where there is visible growth is reached. The disks are transferred to standard beef extract broth in sufficient volume to avoid any inhibitive action, and

18. Novy, F. G.: Bacteriology, Ann Arbor, Mich., George Wahr, 1899.

19. Himebaugh, L. C.: Personal communication to the authors.

after breaking up in the mediums are incubated for a further period of forty-eight hours. The results are tabulated, indicating the distances from the cup where the germicidal action was evident from the fact that no growth of the test organism was obtained.

The results of the antiseptic or growth-inhibitive action are photographed or reproduced by photostat in order to preserve a visual indication of the antiseptic or growth-inhibitive action of the sample examined. It is also important to observe and take into consideration the action of the antiseptic or germicide on blood serum. The method as described can be constantly repeated on the same product without variation in results. An additional advantage of this method is the accuracy with which a portrayal of penetrating antiseptic and germicidal effects under conditions simulating as nearly as is possible in the laboratory the application of antiseptics or germicides to broken skin surfaces may be obtained.

The problem of massive infection is frequently confronted in the practical use of antiseptics. We have previously shown that the action of antiseptics in the presence of massive infection may differ widely from their action under the extreme refinements of the present standard methods wherein the organisms are readily available to the action of the antiseptic. Organisms are not commonly found in the relative dilution of the agar cup plate method of Himebaugh. Hence an antiseptic should be tested in the presence of massive infection or contamination. Therefore, the following technic is offered as a modification of that set forth in previous communications. It enjoys the advantage of being more specifically standardized:

Organisms of known virility and resistance to phenol according to the classification of Reddish are used. They are transplanted for three successive days on agar slants of the following composition: Armour's peptone, 10 Gm.; Liebig's beef extract, 5 Gm.; salt, 5 Gm.; agar, 15 Gm.; distilled water, 1,000 cc., adjusted to a p_H of 6.8. Five cubic centimeters of the agar is placed in each of the usual ⅝ by 5⅞ inch lipped test tubes and autoclaved at 20 pounds pressure for one-half hour. Immediately on removal from the sterilizer the tubes are set at an angle of about 15 degrees to the horizon to insure as nearly as possible even and equal slant surfaces, and also to prevent the formation of the undesirable water of condensation which results from the usual remelting and recooling method of preparing the slants.

From the third successive culture a fresh subculture (known as A) of each organism to be used, is made as follows: With a straight nichrome needle, a smear, or at least three streaks, are made on a fresh agar slant (A). This is incubated at 37.5 C. for twenty-four hours. At the expiration of this time, 10 cc. of the antiseptic to be tested is added to the culture (A). This should be adequate to cover the slant completely when in an upright position. The antiseptic is added at a temperature of 37.5 C. Thenceforth the cultures are maintained at the same temperature by means of a water bath. At intervals of 5, 10, 15, 30 and 60 minutes, transplants from the cultures (A) are made on fresh agar slants (B) or petri plates (mediums as previously described) as follows: With a straight nichrome needle a transplant is removed from the surface of the agar slant (A) and at least three streaks made on the fresh agar (B). This (B) is incubated at 37.5 C for forty-eight hours and then read.

Subcultures (C) are made from all transplants (B) in which there is doubt as to the presence of growth of the organisms.

It is possible to change the time of transplanting from A to B according to the antiseptic used and the accuracy desired. The killing time can be determined more accurately by shortening this transplant time.

The preceding methods have indicated, exclusively, the action of the antiseptic preparation with or without the presence of organic mediums on the organisms under a variety of conditions. However, in practical use, the bacteria against which the product is used constitute only one part of the whole to be considered. Of what value is a proved antiseptic if in clinical usage its toxicity for tissue is a predominant characteristic? It is necessary, therefore, for a complete evaluation of the product, to determine its effect on living animal tissue, the type with which it will come into contact. Two alternatives are open for investigation: (1) the development of a tissue culture technic in which embryonal muscle and epithelial tissue are used, and (2) direct animal experimentation.

1. By comparing the growth of the tissue to which the antiseptic has been added in clinical dilution with the growth of a similar preparation which lacks the antiseptic, one may determine a phase of tissue toxicity. An additional refinement which might be added would be a similar tissue culture preparation to which a known amount of bacterial inoculation had been added, as well as the antiseptic. This would give a direct comparison of germicidal properties in the presence of a large amount of organic matter and tissue, as well as a simultaneous index of the toxicity of the product toward the tissue.

2. The second phase of tissue reaction, thus far not satisfactorily studied, is that of direct animal experimentation. Many biologic products, several of the drugs, and other alkaloids have been directly standardized by animal tests, so that the clinician has incontrovertible proof of their physiologic action. We may in the future anticipate a somewhat similar result to be derived from a carefully worked out animal experimental procedure to determine the value of antiseptics.

CONCLUSIONS

1. The older standard methods of evaluating antiseptics are not entirely satisfactory as a means of judging modern antiseptics, yet the results with these methods are quoted to prove the great value of products newly introduced.

2. The continuance of the use of *Bacillus typhosus* as a single standard organism to determine the value of antiseptics for use against pyogenic organisms is undesirable.

3. It is highly desirable that each antiseptic, germicide and bacteriostatic preparation should be tested against a variety of representative organisms and under a variety of conditions simulating the conditions these preparations are expected to combat, before they are made available for general use.

4. The determination of the practical value of antiseptics is the only reason for the existence of these tests, yet the present standard methods fail to give satisfactory information on the practical efficacy of the product.

5. Various workers have been striving to correct this situation against strong opposition from advocates of the older methods.

6. This unfortunate situation results in exorbitant claims on the part of the manufacturers; the sufferers being the lay public and also the medical profession.

7. The methods advocated for a complete survey of the value of an antiseptic are as follows: (*a*) The phenol coefficient method devised by Reddish. This will weed out many worthless preparations and will offer a standard of comparison with former products. (*b*) The agar cup plate method of Himebaugh. This method demonstrates the penetrating powers of an antiseptic and its activity in the presence of blood serum. (*c*) The massive infection method described

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by us. This determines the activity of the antiseptic in the presence of massive infection.

8. The testing of antiseptics by means of tissue culture and animal experimentation should be added as soon as standardized methods of sufficient accuracy are available.

ANGINA PECTORIS AND DIABETES MELLITUS

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When 122 cases of angina pectoris[1] complicating diabetes were analyzed in 1927,[2] but few other cases for comparison could be found even in such summaries as those of Kahn,[3] Levine,[4] or White.[5] Since 1927, the association of diabetes and angina has become still more prominent not only in the diabetic clinic at the New England Deaconess Hospital but also among our cases after discharge, so that we are now able to report 210 such cases. Certain features of angina in diabetic patients are sufficiently distinctive to suggest that diabetes may bear an important etiologic relationship to coronary disease and angina.

SELECTION OF CASES

Every patient in this series had paroxysmal attacks of pain or a sense of constriction of the chest. The pain, pressure or sense of constriction was localized in the precordial region or more commonly beneath the sternum with or without radiation to an arm or the neck, was usually brought on by exertion or by emotional excitement, and was relieved by rest, vasodilators or hypnotics. Other types of chest pain were rigidly excluded, and it will be evident from what follows that the cardiac pain in the patients of this series always implied serious organic disease of the heart. Acute coronary thrombosis occurred frequently as a terminal event, but the series was selected to include only those patients with previous attacks of angina.

EPIDEMIOLOGY AND ETIOLOGY

Incidence.—The occurrence of 210 cases of angina in 7,000 cases of diabetes mellitus, exceeding so markedly the incidence of angina in a general hospital population, is the first indication of a specific influence on the part of diabetes. A recent compilation of the causes of death in Joslin's series shows that arteriosclerotic heart disease has risen to first place among all causes of death among 1,250 fatal cases of diabetes in the last four years with an incidence of 23 per cent. The increasing longevity of diabetic patients means longer duration of diabetes as well as advancing age. We believe the incidence to be greater than is accounted for by age alone.

Sex.—A second suggestion of a diabetic influence is afforded by the sex ratio. In this group, 122 were males and 88 were females in contrast to the usually much greater proportion of males. Heberden gave a ratio of 30 to 1, Osler of 7 to 1, and the average proportion in about 1,100 cases compiled from the reports of Kahn, Schmidt,[6] Brooks,[7] Levine, Kahn and Barskey,[8] and White was 3 males to 1 female. Such a leveling influence on the sex incidence would be expected, since the incidence of diabetes is nearly the same in the two sexes.

Age.—The average age at onset of diabetes was 51 years for both sexes and the average age at onset of angina was 60 years as compared with 57 years in White's nondiabetic series. On the average, diabetes had been present nine years before the onset of angina. In fact, in 188 cases the diabetes preceded the angina, and in only 9 cases did the angina precede the diabetes. In 13 cases the two diseases were discovered at the same time. The average age at onset of the angina is a little greater in the diabetic than in the nondiabetic series, again possibly owing to the fact that the commonest age for the onset of diabetes, in general, is 51 years and, on the average, angina develops from eight to ten years later.

Duration of Diabetes.—A confirmation of the view that the occurrence of angina in the diabetic patient depends on the duration of diabetes is suggested by cases found early in life among young adults with diabetes of long duration. Two cases occurred between 20 and 30 and four between 30 and 40. Three of these six younger patients died suddenly after diabetes of five, six and eight years' duration, and in two instances postmortem examination revealed acute coronary thrombosis. The influence of the duration of diabetes may be further demonstrated by comparing the incidence of angina in this series with the incidence by decades of patients having diabetes ten years or more, as shown in table 1. Although diabetes most frequently develops at the age of 51 years, diabetic angina occurs most frequently in the decade in which ten year cases of diabetes are most common; namely, the seventh decade of life. The contrast with nondiabetic angina is apparent in Huchard's[9] series, in which the decade of greatest incidence is the fifth. The later age of development of angina in the diabetic patient seems to depend on the fact that an exposure to diabetes of several years' duration is an important factor in its etiology.

TABLE 1.—*Comparison of the Incidence of Diabetic Patients in Successive Decades Ten Years or More After Onset of Diabetes With the Incidence by Decades of Onset of Diabetic and Nondiabetic Angina*

Decade, Years	Ten-Year Cases (Joslin)	Diabetes and Angina	Nondiabetic Angina (Huchard)
0 to 9	..	..	..
10 to 19	9	..	3
20 to 29	19	3	5
30 to 39	54	4	44
40 to 49	174	31	87
50 to 59	476	66	59
60 to 69	707	86	43
70 to 79	310	20	27
80 to 89	51	..	7
Total	1,800	210	277

Severity of Diabetes.—In general, the character of the diabetes in this series was mild in accordance with the age of the patients. The average carbohydrate in the diet prescribed in the hospital for cases without insulin was 91 Gm., and for cases with insulin it was 93 Gm. The lowest carbohydrate tolerance was 2

1. Hereafter for brevity's sake, angina will be used instead of angina pectoris.
2. Hamilton and Root, cited by Joslin: Treatment of Diabetes, ed. 4, 1928, p. 703.
3. Kahn, M. H.: Am. J. M. Sc. **172**: 195 (Aug.) 1926.
4. Levine, S. A.: Angina Pectoris, J. A. M. A. **79**: 928 (Sept. 16) 1922.
5. White, in Nelson's Loose-Leaf Medicine **4**: 502 A, 1926.
6. Schmidt, R.: Med. Klin. **18**: 6-9 (Jan. 1) 1922.
7. Brooks, Harlow: Internat. Clin., series 38, **4**: 12, 1928.
8. Kahn, M. H., and Barsky, Joseph: Ann. Int. Med. **2**: 401 (Nov.) 1928.
9. Huchard, W., quoted by Danielopolu: L'angine de poitrine, Paris, Masson & Cie, 1927, p. 109.

Gm. in a case treated before the discovery of insulin, and the highest was 223 Gm. The average blood sugar for the entire group was 0.17 per cent. One hundred and twenty-one patients took insulin and the average dose was 13 units. The dietary treatment of this group has varied, but the average duration of diabetes of nine years indicates that in the great majority of cases the onset of diabetes occurred before the discovery of insulin, and especially before the inauguration of modern dietary measures. They serve as a control group for future work. We hope that the use of insulin and diets more nearly normal in their proportions of carbohydrate, protein and fat will in the future prevent the premature development of coronary sclerosis, as recently intimated by Shepardson.[10]

Heredity.—Twenty-six patients gave a family history of both diabetes and vascular disease; forty-seven patients, of diabetes without vascular disease, making a total of seventy-three with a diabetic heredity. In seven patients angina had occurred in other members of the family, while in sixty-six patients there was a family history of vascular disease but no angina or diabetes. Thus, ninety-nine patients had an hereditary history of vascular disease.

Hypertension.—Hypertension with a systolic pressure above 150 occurred in 110 patients. It is possible that hypertension was present at some time in a number of the other patients of this series even though blood pressure readings were usually taken on several occasions.

Other Factors.—The average height of the men was 5 feet 7 inches (170 cm.), and at their maximum weight they were 25.3 per cent above standard. The average height of the females was 5 feet 2 inches (157.5 cm.), and at their maximum weight they were 45 per cent above standard. These figures do not materially differ from those of the diabetic group as a whole. Rheumatic fever was not a predisposing factor. Four patients of 174 had positive Wassermann reactions, making an incidence of 2.3 per cent, as compared with 1.9 per cent for 5,086 diabetic patients given by Joslin.[11] One patient had aortitis. Race was of minor importance; thirty-three cases, or 15.7 per cent, occurred among Jews, but in this series of diabetic patients the Jewish race provides 13 per cent of all cases.

PATHOGENESIS

The amount and extent of arteriosclerosis in diabetic subjects that have been examined post mortem is astonishingly great. Every one with a duration of diabetes of five years or more has shown some degree of coronary sclerosis. Actual thrombosis with infarction of the heart, recent or healed, has been present in 25 per cent of 100 autopsies of diabetic subjects at the New England Deaconess Hospital, and in the larger series reported by Warren[12] the incidence of coronary thrombosis with infarction of the heart was 12 per cent. Necropsy in seventy-seven cases of diabetes reported by Blotner[13] showed marked disease of the coronary vessels in 45 per cent, while in 10 per cent death was due to cardiac infarction. Levine[14] found diabetes present in 14 per cent and Conners[15] in 10 per cent of their cases with coronary thrombosis. Rupture of the heart occurred twice and aneurysmal dilatation of the wall of the left ventricle twice in the Deaconess Hospital series. This extraordinarily high incidence may be compared with the observations of Benson and Hunter,[16] in whose series of 1,750 patients, most of whom were coroners' cases, coronary infarction plus cardiac aneurysms formed 4 per cent of the whole.

Advanced coronary disease, as well as sclerosis of the myocardium, has been present in every case of angina examined post mortem at the New England Deaconess Hospital. In table 2 is presented a summary of the

TABLE 2.—*Postmortem Observations in Twenty-Five Cases of Angina and Diabetes*

Case	Duration, D. M.	Sex*	Age at Death, Years	Heart			
				Weight, Gm.	Coronary Arteries†	Sclerosis of the Myocardium	Infarction
1	1.4	♂	61.8	520	C++++	++	+
2	1.8	♀	65.5	250	C+++	++	0
3	2.7	♂	54.8	325	C++++	+++	+
4	3.0	♀	74.0	...	C+++	+	+
5	6.1	♀	52.3	440	C+++	+	+
6	6.9	♂	69.4	440	C++++	+++	+
7	7.0	♂	64.7	...	C++	++	+
8	8.0	♀	33.0	315	C++++	+	+
9	8.4	♀	61.3	450	C++++	+	0
10	8.7	♂	57.8	510	C+++	+++	+
11	8.9	♀	70.1	250	C+++	++	+
12	10.0	♀	56.3	280	C++++	++	+
13	14.0	♂	67.0	520	C++++	++	0
14	14.8	♀	60.3	360	C++++	++++	+
15	15.3	♀	66.2	285	C++++	+++	+
16	16.9	♂	52.7	550	C++++	++++	+
17	20.7	♂	66.6	...	C++++	++	+
18	21.8	♀	70.0	390	O++++	+++	0
19	25.0	♀	62.0	333	C+++	++	..
20	25.0	♂	76.0	480	C++++	++	+
21	26.0	♂	57.1	400	C+++	+++	+
22	28.1	♀	63.0	350	C++++	++++	+
23	33.7	♀	62.7	340	C++++	+	+
24	35.0	♂	67.0	410	C++	+++	0
25	38.0	♂	73.6	500	C++++	++++	+

* In this column, ♂ indicates male; ♀, female.
† C indicates calcification.

observations. The character of the sclerosis and calcification of the coronary arteries was uniform. The coronary arteries are of the muscular type and show changes strikingly similar to the changes found in the muscular arteries of the legs in diabetic gangrene. Evidence of syphilitic or rheumatic infection of valves, myocardium or aorta was absent except in patient 2, who had syphilitic aortitis, but more advanced coronary disease. The average weight of the heart in twenty-two patients at autopsy was 386 Gm. The advanced character of the myocardial changes, in spite of the mildness of the anginal attacks, is a distinctive feature clearly shown by the autopsy data. In fact, one wonders how many diabetic patients with undoubtedly marked coronary sclerosis escape having angina.

The electrocardiogram is the best laboratory means of determining coronary disorder before death. Most authors, in reviewing unselected series of angina, have not found this procedure to be helpful in more than 40 per cent of the cases. In fifty cases of this series studied by Dr. J. Lamelas, definite electrocardiographic changes occurred in 60 per cent. Significant inversion of the T wave (coronary type) in leads I or II, or the Pardee[17] sign was present in twenty-three cases. Other observations consisted of two cases of partial atrioventricular block, three cases of bundle branch block and two of auricular fibrillation. This emphasizes again the advanced cardiac pathologic change typically found in this series.

10. Shepardson, H. C.: Arteriosclerosis in Young Diabetic Patient, Arch. Int. Med. **45**: 674 (May) 1930.
11. Joslin, E. P.: Treatment of Diabetes, ed. 4, Philadelphia, Lea & Febiger, 1928, p. 754.
12. Warren: Pathology of Diabetes, Philadelphia, Lea & Febiger, 1930, p. 674.
13. Blotner: New England J. Med. **203**: 709, 1930.
14. Levine, S. A.: Medicine **8**: 245 (Sept.) 1929.
15. Conners: Read before the Association of American Physicians, Atlantic City, May 6, 1930.
16. Benson, R. L., and Hunter, W. C.: Northwest Med. **24**: 606 (Dec.) 1925.
17. Pardee, H. E. B.: Am. J. M. Sc. **169**: 270 (Feb.) 1925.

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SPECIAL POINTS IN TREATMENT

The treatment of angina by the usual drugs and methods is not within the purpose of this paper, but certain aspects of diabetic treatment should be mentioned. Although it is difficult to demonstrate a direct and immediate effect exerted by diabetic treatment on the frequency and character of anginal attacks, a variety of facts indicate that metabolic factors are of importance. Middleton and Oatway [18] found definite depression of the T-wave in 100 per cent of cases of insulin shock with true hypoglycemia. Experimentally Cruickshank [19] found that although the isolated normal heart responds to insulin by storing glycogen, provided the blood sugar is not abnormally low, the diabetic heart stores glycogen only if the blood sugar is maintained well above normal. After diabetes of eight or more years' duration, the heart may become accustomed to an elevated blood sugar. Sudden reductions in the blood sugar brought about by reductions in diet or by insulin are not well borne. In patient 11, fatal coronary thrombosis, proved at autopsy, occurred during insulin hypoglycemia. In Blotner's series, death from cardiac infarction occurred in three cases shortly after a rapid fall in blood sugar concentration following the administration of insulin. By contrast, the relief of attacks when glycosuria and hyperglycemia were controlled by properly adjusted insulin have been reported by Hetenyi.[20] The use of dextrose solution, injected intravenously in amounts of 20 cc. of a 50 per cent solution, sometimes gives relief when attacks occur frequently, and in one case gave greater subjective comfort than any other means. In one patient, recently, the attacks became less frequent and less severe when, by better adjustment of diet and insulin, the carbohydrate of his diet was slowly increased from 40 to 120 Gm. During coronary thrombosis, especially if congestive failure is present, a marked decrease in carbohydrate tolerance is observed, and the degree of loss parallels the seriousness of the prognosis. However, it is by no means always true that a slight disturbance in the carbohydrate tolerance gives a good cardiac prognosis. In general, with better control of the diabetes, a diminution in the frequency and severity of the anginal attacks is often obtained.

PROGNOSIS

The diabetic patient with angina has a poorer prognosis than the nondiabetic patient. The average duration of life from the first attack of angina to death was only 2 years in the 136 fatal cases. Eighty-five, or 62.5 per cent, of these deaths occurred during the first year after the onset of angina, in contrast with 25 per cent in Gallavardin's series. White [21] gives the average duration of life in his series of 200 unselected patients as 3.4 years for fatal cases. Mackenzie [22] found the average duration of life in 213 fatal cases of angina to be 5.4 years. Improvement in diabetic diets may retard the precocious development of vascular disease in the future.

The patients in our series dying in the first year of angina were those with conspicuously little treatment of diabetes. In contrast are the instances of death after angina of fifteen years' duration, patients 20 and 25. One, a dentist, and the other, a physician, were faithful to the best diabetic treatment available, and as years passed carbohydrate tolerance greatly improved. With present-day diets approaching normal standards, fewer diabetic patients should develop angina and more should survive for as long a period as the nondiabetic.

COMMENT

The association of diabetes, angina and intermittent claudication has been described by Heitz.[23] Is there some single inborn or inherited factor responsible both for diabetes and for a marked susceptibility of the heart to coronary disease and to angina? This conception would make the development of diabetes merely incidental in the life of a patient predestined to coronary disease. One would expect in such combined cases the same sex distribution as in nondiabetic angina, that angina would as frequently precede the diabetes as the reverse, and, because one third of all diabetes originates before the fortieth year of age, that the average age of onset in diabetic angina might be earlier than in nondiabetic cases. On the contrary, however, if the development of angina depends on the existence of clinical diabetes, then the frequency of angina in diabetes would be greater among cases of long duration. The curve of incidence of angina in diabetes would follow, not the ages of onset of diabetes, but the curve of cases with diabetes long enough for diabetes to bring about its effects (table 1). The age of greatest frequency of diabetic angina would be the decade in which there is the largest number of persons alive after having diabetes eight or more years; namely, the decade from 60 to 69 years. At present it seems more consistent to regard diabetes and the metabolic changes associated with it as contributing directly to bring about coronary disease, and the inherited factor as that of the diabetic tendency already generally accepted.

For the apparently increasing association of diabetes and angina, the following explanations may be offered:

1. Formerly, the average duration of life of the diabetic patient was too short to permit the full effect of diabetes to be exerted on the coronary vessels and myocardium.

2. The mildness of the attacks, in many cases due to the low nervous sensitivity of diabetic patients or the inactive life they lead, especially under former methods of treatment, gave little evidence until a fatal attack, which in many cases was regarded as diabetic syncope or atypical coma.

3. Formerly, the lack of blood sugar analyses prevented the diagnosis of diabetes. The tendency for an increase in the renal threshold with increasing duration of diabetes may have resulted in the patient's urine being sugar free when his angina was discovered in the cardiac clinic. The use of urine and blood sugar analyses one hour after a full meal and dextrose tolerance tests is often necessary to establish the presence of diabetes, and should be more frequently employed in the study of angina.

SUMMARY AND CONCLUSIONS

1. Two hundred and ten cases of angina complicating diabetes mellitus are reviewed.

2. The incidence of angina in patients with diabetes mellitus is extraordinarily high.

3. The nearly equal sex ratio suggests the leveling influence of the associated diabetes.

4. The occurrence of angina in the young, the long duration of diabetes before the onset of angina, and

18. Middleton and Oatway: Am. J. M. Sc. **18**: 46, 1931.
19. Cruickshank, E. W. H., quoted in New England J. Med. **201**: 600 (Sept. 19) 1929.
20. Hetenyi, G.: Wien. Arch. f. inn. Med. **13**: 95 (Sept.) 1926.
21. White, P. D.: Prognosis of Angina Pectoris and of Coronary Thrombosis, J.-A. M. A. **87**: 1525 (Nov. 6) 1926.
22. Mackenzie, James: Angina Pectoris, London, Frowde, 1923.
23. Heitz, L.: Arch. d. mal. du cœur **17**: 350 (June) 1924.

the late age of onset of angina, all point to the complicating diabetes as the factor that makes this group differ from the nondiabetic series.

5. The prognosis for life is shorter than in the nondiabetic series but should improve with modern dietary and insulin treatment.

6. Diabetes mellitus with its associated coronary disease is a frequent contributing factor in the production of angina and, like syphilis, its presence should be investigated by special methods, such as blood sugar analyses.

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DIABETES AND PERNICIOUS ANEMIA

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The combination of pernicious anemia and diabetes mellitus has been repeatedly described as extremely rare. The first case was reported in 1910 by Parkinson.[1] Within the last two years, nine instances have occurred at the New England Deaconess Hospital, and I have been able to discover a total of forty-eight cases, including unpublished records of patients given to me by other physicians and cases recorded in the literature. The increased interest of physicians inspired by the recent discoveries in the treatment of the two diseases has stimulated diagnosis, but another factor is the increase in the duration of life resulting from improvement in treatment, which affords more opportunity for the combination to occur.

The relative frequency of the two diseases is indicated in tables 1 and 2 by the statistics of Goudsmit [2] for Holland and by statistics from the Metropolitan Life Insurance Company (New York), prepared by Mr. Herbert Marks.

Since the two diseases are most frequent at approximately the same period of life, there should be a reasonably frequent occurrence of the combination unless there is some specific factor preventing the combination. I have found in the New England Deaconess Hospital series and in the case records of Dr. E. P. Joslin a total of 13 cases in approximately 7,000 cases of diabetes. Adams [3] states that during one period at the Mayo Clinic among 2,000 cases of diabetes and 1,000 cases of pernicious anemia but 3 instances of the combination were observed. Goudsmit [2] found five cases in Holland among a group consisting of 1,650 cases of diabetes and 379 cases of pernicious anemia seen between 1925 and 1930. It is notable that the great majority of the 48 cases in this series have occurred within recent years, and probably the combination is much more frequent than is generally supposed.

TABLE 1.—*Deaths from Diabetes and Pernicious Anemia in Holland (Goudsmit)*

	1926	1927	1928
Diabetes mellitus	1,190	1,233	1,255
Pernicious anemia	391	366	222

In table 3 are listed forty-eight cases. The first thirteen are from the New England Deaconess Hospital diabetic clinic, and the fourteenth from the Peter Bent Brigham Hospital, Boston. The remainder have been abstracted from clinical reports or are reported by courtesy of physicians who have given me their records.

A study of etiologic factors gives various interesting comparisons. The incidence of diabetes is nearly equal in the two sexes, whereas in pernicious anemia males tend to outnumber the females. Of the forty-eight cases in table 3, the males number twenty-four as against twenty-four females. The youngest patient in this series to develop pernicious anemia was 32 and the oldest 70 years of age. Nineteen were between the ages of 45 and 55 years, the period of greatest frequency for the onset of pernicious anemia. The commonest age for the development of diabetes is 51 years. It is notable that in thirty-one cases the diabetes definitely preceded the anemia. In four cases, pernicious anemia occurred first. In the remainder either the diagnoses were discovered at the same time or else the data are incomplete.

Heredity is increasingly important in any consideration of the etiology of diabetes. In the thirteen cases from the New England Deaconess Hospital, pernicious anemia was present in the families of three and diabetes was present in the families of five. Conner,[4] in studying the families of patients with pernicious anemia, has reviewed information indicating the frequency of familial cases and the frequency of achlorhydria in other members of the family. One of Goudsmit's patients with combined diabetes and pernicious anemia had a brother and a sister with diabetes, but the familial data are not available for most of the other thirty-seven cases.

TABLE 2.—*Death Rates per Hundred Thousand from Diabetes Mellitus and from Pernicious Anemia; White Males and White Females Separately* *

	White Males		White Females	
	Diabetes Mellitus	Pernicious Anemia	Diabetes Mellitus	Pernicious Anemia
1921	10.9	2.0	19.6	4.1
1922	11.6	1.8	22.3	4.2
1923	11.1	2.2	20.6	4.0
1924	9.3	2.3	19.6	4.5
1925	9.3	2.4	20.3	4.9
1926	10.3	2.6	22.3	5.0
1927	9.7	2.1	22.5	4.0
1928	10.4	1.8	23.5	2.6
1929	10.5	1.4	24.5	2.7

* Metropolitan Life Insurance Company Industrial Department, 1921 to 1929.

An extraordinary illustration of the familial relationships of diabetes and pernicious anemia is given from the records of Dr. George R. Minot and quoted by Joslin: [5]

> Patient, aged 59 years, male, has undoubted pernicious anemia. Brother, aged about 59 years, "has often had sugar in urine and is said to have pernicious anemia with mild cord symptoms." Sister, aged 55 years, "anemic for eight years," undoubted pernicious anemia now. Brother, aged about 50 years, has undoubted diabetes from history given. Brother, aged about 49 years, well. Mother died of diabetes. Father "showed sugar in urine in last illness and died of infected foot that became gangrenous." Father's brother "had anemia and died of it." Father's sister died in thirties of pneumonia. No other brothers or sisters. Mother's sister had diabetes.

1. Parkinson: Lancet **2**: 543, 1910.
2. Goudsmit, J.: Nederl. tijdschr. v. geneesk. **74**: 1429 (March 22) 1930; abstr. J. A. M. A. **94**: 2033 (June 21) 1930.
3. Adams, S. F.: M. Clinics N. America **8**: 1163 (Jan.) 1925. Permission to refer to three later cases from the Mayo Clinic kindly given by Dr. Adams, who is to report them in detail.
4. Conner, H. M.: Hereditary Aspect of Achlorhydria in Pernicious Anemia, J. A. M. A. **94**: 606 (March 1) 1930.
5. Joslin, E. P.: Treatment of Diabetes Mellitus, ed. 4, Philadelphia, Lea & Febiger, 1928, pp. 761-762.

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TABLE 3.—*Forty-Eight Cases of Combined Diabetes and Pernicious Anemia*

Case or Author	Sex*	Age at Onset: D. M. Yr.	Age at Onset: P. A. Yr.	Gastric Free Hydrochloric Acid	Blood: Date of Blood Counts	Blood: Hemoglobin, Per Cent	Blood: Red Blood Cells, Mill.	Blood: Sugar, Per Cent	Blood: Wassermann	Urine: Sugar, Per Cent	Urine: Diacetic Acid	Spinal Cord Changes	Treatment	End-Results: Living or Dead	End-Results: Date	End-Results: Age	End-Results: Cause
Deaconess Hospital	♂	59	66	...	Dec. 1906	60	1.8	....	.....	1.0	0	..	Iron	D	Jan. 1907	69	P. A.
	♂	57	64	0	Jan. 1910	80	....	....	.....	0.5	..	..	Transfusion	D	Mar. 1910	65	Gallstones
	♂	43	49	...	Nov. 1924	70	3.3	0.20	Neg.	1.9	0	0	Iron and arsenic	D	Mar. 1926	52	P. A.
	♂	49	62	...	Nov. 1926	40	1.7	0.28	Neg.	1.4	0	..	.....	D	Apr. 1927	62	Coma
	♂	50	55	0	Jan. 1928	40	1.2	0.23	Neg.	0.2	0	++	Liver, insulin	L	Aug. 1929	58	
					Dec. 1928	75	3.4										
					Feb. 1929	85	4.5										
	♀	44	47	0	Dec. 1928	75	3.8	0.21	Neg.	1.7	0	++	Liver, insulin	L	July 1930	48	
	♀	54	61	0	May 1928	60	1.8	0.16	Neg.	0	0	0	Liver	L	Feb. 1929	62	
					Aug. 1928	90	5.2										
	♂	61	65	0	Dec. 1926	36	2.3	....	.....	...	..	..	Liver, insulin	D	Oct. 1930	69	Gangrene
					Jan. 1929	68	4.6	0.26	Neg.	0.2	0	++					
					May 1929	90	4.6										
	♂	60	60	0	July 1929	50	2.9	0.18	Neg.	1.7	0	0	Liver	L	July 1929	60	
	♂	55	56	0	July 1929	75	2.1	0.34	Neg.	4.8	+	0	Liver, insulin	L	July 1929	56	
					July 1929	80	3.9	0.11									
	♀	61	58	0	Aug. 1926	65	2.2	0.20	Neg.	1.7	0	0	Liver	L	Nov. 1929	61	
	♀	68	68	0	Oct. 1929	50	1.0	0.21	Neg.	0.3	0	0	Liver	L	Nov. 1929	68	
	♀	59	64	0	Dec. 1929	70	3.0	0.20	.....	2.0	0	+	Insulin, liver	L	July 1930	65	
Peter Bent Brigham Hospital	♀	50	50	0	Mar. 1920	70	3.8	0.13	Neg.	1.0	+	0	Transfusion, diet	L	Apr. 1920	50	
					Apr. 1920	30	1.9	0.30	.....	5.0	+						
					Apr. 1920	45	2.1										
Parkinson: Lancet **2**: 543, 1910	♂	49	48	0	June 1909	30	1.4	....	.....	0	0	..	Arsenic and hydrochloric acid	D	Dec. 1909	49	Diabetic coma
					Dec. 1909	40	2.0	....	.....	5.5	0						
Chvostek: Wien. klin. Wchnschr. **5**: 121, 1918	♂	30	45	...	1918	..	1.0	....	.....	4.5	0	..	Arsenic	D	1919	46	Coma
Giffin and Bowler: Minnesota Med. **6**: 13 (Jan.) 1923	♂	43	48	0	.....	65	3.1	0.39	Neg.	2.5	..	?	Diet	D	July 1923	51	
Schumann: J. A. M. A. **85**: 677 (Aug. 29) 1925	♀	55	55	...	Sept. 1923	35	1.2	0.22	Neg.	++	0	++	Transfusion, insulin	D	Mar. 1925	57	P. A.
Adams: M. Clinics N. America **8**: 1163 (Jan.) 1925	♀	58	59	0	Mar. 1923	78	3.9	0.32	Neg.	8.2	0	+	Transfusion, insulin	D	Apr. 1924	60	P. A.
					Jan. 1924	41	1.8	0.41	.....	3.5	0						
	♀	46	54	0	Dec. 1923	48	2.8	0.23	Neg.	—	—	+	Insulin	D	Oct. 1924	57	
	♂	44	54+	No other data except that pernicious anemia developed after diabetes													
	♂	50	51	0	July 1925	65	3.6	....	.....	6.0	+						
					Mar. 1926	55	2.4	0.22		...	..	+	Insulin, liver	L	Aug. 1929	55	
	♀	64	64	0	1926	50	2.8	....	Neg.	1.0	0	+	.....	L	Oct. 1929	68	
	♀	62	62	0	Sept. 1922	56	2.8	0.17	Neg.	0	0	+					
Wright: Clifton M. Bull. **12**: 64, 1926	♀	49	51	0	Dec. 1925	80	4.1	0.23	Neg.	0.5	0	+	Insulin, liver	L	Sept. 1926	52	
					Feb. 1926	69	3.8										
	♂	59	66	0	Jan. 1926	36	1.3	0.30	Neg.	...	..	+	Transfusions(8), insulin	D	Sept. 1926	66	
					Apr. 1926	31	1.8										
	♂	..	52	0	Jan. 1926	65	2.6	0.28	Neg.	0	0	0	Liver, insulin	D	Aug. 1927	53	Thrombosis pulmonary artery
				0	June 1927	109	5.8										
Baumgartner: Clifton M. Bull. **16**: 1, 1930	♂	65	65	0	Mar. 1927	35	1.6	0.21	Neg.	0.2	0	0	Liver, insulin	L	Sept. 1929	67	
					June 1927	95	5.9										
Arntzen: Norsk. Mag. f. Lagevidensk. **91**: 489 (May) 1930	♀	67	66	...	Oct. 1928	44	1.5	0.24	.....	...	..	..	Liver	L	Oct. 1929	69	
Hitzrot: Am. J. M. Sc. **177**: 213 (Feb.) 1929	♂	39	40	0	Mar. 1926	42	1.5	0.23	Pos.	...	..	..	Transfusions(5), liver, insulin	L	Apr. 1928	41	
					Nov. 1927	80	4.0										
Yang: Quoted in Joslin, Treatment of Diabetes, ed. 4, 1928, p. 761	♀	41	46	...	Mar. 1927	20	1.0	0.44	.....	...	..	..	Transfusions, liver, insulin	L	June 1927		
					June 1927	75	3.5										
	♀	50	60	...	July 1929	25	1.7	....	Neg.	...	..	0	Insulin, liver	L	Feb. 1930		
Rabinowitch: Personal communication to author	♂	58	58	0	Feb. 1924	24	1.1	0.34	.....	0	0	0	Arsenic and hydrochloric acid	D	Feb. 1924	58	P. A.
	♂	47	48	0	July 1925	24	0.8	0.13	.....	0	0	0	Liver diet	L	Aug. 1930	53	
	♀	60	61	0	Mar. 1929	70	3.1	0.19	.....	0	0	0	Liver and diet	L	July 1930	62	
Castle: Personal communication to the author	♀	50	56	0	Oct. 1927	60	3.1	....	.....	2.0	0	..	Insulin, liver	L	Aug. 1929		
					Apr. 1928	86	5.0	0.21	Pos.	2.0	+++						
Minot: Personal communication to the author	♂	40	40.5	0	July 1928	60	2.5	0.15	.....	1.0	..	0	Liver	L	Mar. 1930		
					Oct. 1929	85	5.3										
Murphy: Personal communication to the author	♂	51	52	0	Dec. 1926	70	3.2	0.25	Neg.	2.0	0	+	Liver	L	Mar. 1930		
Berghausen: South. M. J. **22**: 504 (June) 1929	♀	55	70	...	Nov. 1928	65	2.7	0.21	Neg.	Tr.	0	+	Liver	D	Feb. 1929		
Meulengracht: Klin. Wchnschr. **8**: 18 (Jan. 1) 1929	♀	33.8	33	...	Nov. 1927	56	1.9	0.26	.....	++	0	..	Liver, insulin	L	June 1930	35	
Bowen: J. A. M. A. **95**: 30 (July 5) 1930	♂	55.5	55	0	May 1929	50	2.7	0.30	.....	++	0	..	Liver, insulin	L	Feb. 1930	56	
Goudsmit: Nederl. Tijdschr. v.	♂	51	55	0	July 1929	60	2.3	0.18	Neg.	+	0	..	Liver, insulin	L	Nov. 1929	55	
	♂	43	45	...	Mar. 1926	30	1.2	....	.....	2.0	+	..	Diet	D	1926	45	
Geneesk. **74**: 1447 (March 22) 1930	♂	60	61	...	Jan. 1928	50	1.7	....	Neg.	...	..	..	.....	D	Aug. 1928	61	Coma
	♀	63	63	...	Jan. 1928	58	1.9	0.25	Neg.	1.5	0	..	Diet	L	Jan. 1928	63	
	♀	60	63	...	Nov. 1926	20	0.6	0.40	.....	...	..	..	Insulin	D	Nov. 1926	63	P. A.
Tillgren: Acta Med. Scan. 1930, supplement 34, 80	♀	32	32	...	Apr. 1928	70	3.1	0.29	.....	1.7	..	..	Insulin, liver	D	1929	33	Tuberculosis
	♀	54	62	...	Feb. 1929	19	2.7	0.21	.....	0.7	..	..	Insulin, liver	D	June 1929	63	Gangrene

* In this column, ♂ indicates male; ♀, female.

Definite information given concerning this. Mother's brother died of old age. No other brothers or sisters. Patient's paternal grandfather probably died of pernicious anemia. He was said to have been very pale in last two years of life and had difficulty in walking. An ill-defined history of this man's brother suggests that he had anemia.

Achlorhydria as an etiologic factor in pernicious anemia has been given a new significance by the work of Castle,[6] who has shown that gastric digestion is defective in pernicious anemia since the stomach is unable to prepare, as it can do normally from protein, a substance effective in alleviating anemia. Immediately this raises the question of the relationship of diabetes and achlorhydria, since in this series the diabetes has so clearly preceded the anemia in most cases. Bowen and Aaron,[7] Mason,[8] Joslin[9] and Rabinowitch[10] have recorded series of observations indicating not only that achlorhydria occurs in from 30 to 40 per cent of diabetic patients but that its frequency tends to increase with the duration of diabetes and the age of the patient. In turn, it must not be forgotten that achlorhydria is much more frequent in healthy old persons than in youth. Conner studied achlorhydria in the families of 110 patients with pernicious anemia and found an increasing incidence of achlorhydria with increasing age, so that between the ages of 50 and 60 years 25 per cent had achlorhydria. The incidence of achlorhydria as observed in the cases of diabetes from the Deaconess Hospital is combined in table 4 with the results of Bowen and Aaron. In 20 per cent of the cases under five years' duration, 35 per cent of those between five and ten years, 45 per cent of those between ten and fifteen years, 29 per cent of those between fifteen and twenty years, and 33 per cent of those between twenty and twenty-five years, there was no free hydrochloric acid.[9]

TABLE 4.—*Gastric Secretion in Diabetes According to Age of Patient and Duration of Disease*

Number of Patients	Duration of Disease	Average Age	Sex		Free Hydrochloric Acid		
			Male	Female	Normal or Above	Diminished	Absent
	Deaconess Hospital						
10	Under 5 years	46	4	6	8	0	2
10	From 5 to 10 years	53	3	7	6	1	3
7	From 10 to 15 years	55	1	6	5	0	2
5	From 15 to 20 years	58	1	4	4	0	1
5	From 20 to 25 years	56	3	2	4	0	1
	Bowen and Aaron						
46	Under 5 years	49	16	30	29	8	9
16	From 5 to 10 years	53	3	13	4	6	6
4	From 10 to 15 years	50	2	2	1	0	3
2	From 15 to 20 years	66	1	1	1	0	1
1	From 20 to 25 years	64	0	1	0	0	1
106	.....	..	34	72	62, or 58.5%	15, or 14.2%	29, or 27.3%

Diabetes of long duration plus achlorhydria may prepare the way for the development of pernicious anemia. The influence of such factors as gallstones and cholecystitis, or other infections is suggested by two cases in which severe anemia (not finally classified as pernicious) developed during observation in the Deaconess Hospital while treatment was being given for severe infections of the extremities. In both cases repeated transfusions of blood were utilized. Patients 2 and 12 had gallstones, as did Goudsmit's first patient. Patients 3 and 5 had advanced pyorrhea and apical abscesses. Patient 4 had an amputation of the toe for osteomyelitis and developed anemia shortly thereafter. He had one remission and died two years later. A suggestion of diabetic influence is given by patient 14, from the Peter Bent Brigham Hospital, in whom, as severe acidosis developed, a severe degree of anemia rapidly occurred. Also in patient 4, when acidosis developed, his attending physician noted that the anemia was severe and that the blood smear contained many nucleated red cells. This is all the more significant when it is remembered that ordinarily the development of acidosis and dehydration in a diabetic concentration of the blood tends to obscure anemia by giving a relative polycythemia. Furthermore, during a period of severe anemia, the diabetes may also be resistant to treatment, as was noted by Adams.

6. Castle, W. B.: Proc. Roy. Soc. Med. (Sect. Med.) **22**: 58-60 (July) 1929.
7. Bowen, B. D., and Aaron, A. H.: Gastric Secretion in Diabetes Mellitus, Arch. Int. Med. **37**: 674 (May) 1926.
8. Mason, quoted by Joslin: Loose-Leaf Medicine, 1929, p. 109 K, New York, Thomas Nelson & Sons.
9. Joslin, E. P.: Loose-Leaf Medicine, 1929, p. 109 K.
10. Rabinowitch, I. M., to be published.

PATHOLOGY

The pathologic changes of combined diabetes and pernicious anemia have been little studied. Seven autopsies have been found. In Parkinson's patient pernicious anemia preceded the diabetes, which developed rather acutely, and death occurred fifteen days after the onset of diabetic symptoms, apparently from the anemia. Postmortem examination gave the following results:

Deep, red marrow in femur, sternum and ribs. Enlarged spleen. Brown-yellow liver. Chronic gastritis. Bright yellow subcutaneous fat. Small pancreas. No "tigering" of myocardium. Fatty atheromatous flecks in aorta with calcareous plaques. Congestion and severe parenchymatous degeneration of kidneys. Ectopic suprarenal gland. Anemia of brain (3 pounds, 1½ ounces [1.4 Kg.]).

MICROSCOPIC

1. Marrow of femur: Sections were stained by S. G. Scott's "tartrazin-Jenner" method in hematoxylin and eosin and in van Gieson's stain. The marrow is cellular throughout. The number of myeloblasts and myelocytes is much in excess of the number of erythroblasts and erythrocytes. Strands of erythroblasts are, however, conspicuous. There are few leukocytes. The megakaryocytes are few in number and of small size. The relative number of myeloblasts to myelocytes is abnormally high. The majority of the erythroblasts are megaloblasts: gigantoblasts are also present. The variation in the size of the erythrocytes is extreme, microcytes being present in addition to megalocytes and gigantocytes. The erythrocytes also vary in staining reaction. There are a few macrophages containing red corpuscles.

2. Liver: There is no fibrosis. There is a little fatty degeneration of the cells surrounding some of the central veins. In tissue fixed in alcohol there is much granular pigment within the cell columns. This pigment is present throughout the lobules but is much more abundant in the peripheral zone. It gives the Trumbull's blue and prussian blue reactions.

3. Body of pancreas: The lobules do not appear to be abnormally small. The cells of the acini are well formed and brightly stained. There are numerous islands of Langerhans; many of these are of large size. The cells of the islands show no sign of degeneration, they are of normal shape and their nuclear structure is very distinct. There is neither interlobular nor intralobular fibrosis. There is no deposit of pigment.

4. Kidney: The media of the arteries is thin and there is a little reduplication of the elastic lamina. There is no increase in the interstitial tissue. The cells of the first convoluted tubules are large and swollen with well defined margin. The base is occupied by large fat globules. The rest of the protoplasm is opaque and granular. Many of the cells have no

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nucleus, in others the nucleus is pale and degenerate. The swollen cells in most of the tubules almost occlude the lumen; in a few tubules there are granular or vacuolar spherical bodies in the lumen. The cells of the ascending limb of the loop of Henle show very similar changes. In the second convoluted tubules there is much less fatty degeneration; in some there is slight catarrhal desquamation, or the lumen may contain some granular débris. A few fat granules are seen in many of the cells of the descending tubules of Henle and in the large collecting tubules. In many of the latter there is considerable catarrhal desquamation, in others there are hyaline casts. In the cells of the first convoluted tubules are a few fine granules of pigment which give the iron reactions. In the ascending limb of Henle's loop are large granules of yellow pigment which do not give an iron reaction. There is some swelling of the intercapillary substance of the glomeruli. No glycogenic degeneration is present.

To summarize the microscopic appearances of the pancreas and kidney, it may be said that the appearance of the kidney is compatible with a diagnosis of ordinary diabetes or glycosuria and suggests that the pernicious anemia was complicated by diabetes. But the pancreas shows none of the changes found in ordinary diabetes or glycosuria.

A diabetes comparable to that which occurs in hemochromatosis (diabetic bronze) might conceivably be caused by pernicious anemia. Thus, Quincke mentions a case of pernicious anemia in which pigment cirrhosis of the liver occurred. In the present case, however, the complete absence of pigmentation and cirrhosis of the pancreas shows that this explanation is untenable.

The necropsy report in the first case of Adams (case 19, table 3) was summarized by him as follows:

There was considerable emaciation; the spleen weighed 312 Gm.; its cut surface was brick red; the liver weighed 1,787 Gm.; the cut surface was yellowish; the stain for iron was positive. The pancreas weighed 68 Gm. There was extreme fatty replacement. The parenchyma was dense and fibrous. The bone marrow was grayish red. A section of the liver revealed slight thickening of the capsule and a fairly marked periportal fibrosis, microscopically. The polygonal cells were faintly stained in areas. Moderate diffuse fatty changes were present. The sinusoids were not distinct and contained small amounts of a yellowish brown pigment. Much of the pigment was distinctly within the Kupffer cells. The iron stain showed this pigment to contain hemosiderin. In the pancreas there was marked atrophy of the acinar tissue; certain areas contained none. The ducts, surrounded by islands lying in a fibrous connective tissue bed, with large spaces of loose fragmentary fibrous tissue, extended in every direction. In other areas there were groups of ducts with no acinar tissue between or around them; in still other areas, small islands of acinar tissue in a loose connective tissue framework, and marked fatty changes. The islands had hyalofibrinoid changes. In the bone marrow were a moderate number of megaloblasts, numerous normoblasts, and eosinophils. There was no evidence of its normal fatty structure.

Wright's third case (case 27, table 3) was extraordinary in that with modern liver treatment a remarkable remission in the pernicious anemia occurred and polycythemia developed. The patient died with thrombosis of the pulmonary artery. Patient 8 in my series died of gangrene of a foot due to thrombosis and not infection. Thrombosis may have been a factor in causing gangrene in one of Tillgren's cases. Goudsmit mentions postmortem examinations in his second and fifth cases. In the first a small pancreas and large liver were found and in the second hemosiderosis was a conspicuous feature. In Chvostek's case, chronic pancreatitis was found at autopsy. Rabinowitch's first patient (case 33, table 3) showed diffuse fatty degeneration. A remarkable feature during life in this case was the high renal threshold as indicated by a fasting blood sugar of 0.34 per cent without glycosuria.

CLINICAL OBSERVATIONS

The diabetes observed in the forty-six cases cannot be described as differing from the usual forms of the disease. In the Deaconess Hospital series, diabetes was as mild as in the average case of middle life. The blood sugars were of the usual range. All patients in the insulin era did well and developed a tolerance of 100 or more grams of carbohydrate, taking moderate doses of insulin varying from 10 to 30 units a day. Acidosis occurred as a terminal event in one case, and at the time the physician in attendance described a blood smear, showing evidence of severe anemia. The diagnosis of diabetes was in doubt in two cases of pernicious anemia described by Dr. I. M. Rabinowitch. In one, the fasting blood sugar was 0.20 per cent, and in the other the maximum was 0.192 per cent when the urine was sugar free. He considers them potential diabetic patients. The first had gallstones. Postmortem examination in the first showed only diffuse fatty degeneration. In general, the degrees of anemia observed were not unusual. In the Deaconess Hospital series the patients for the most part had been under the observation of some physician and were sent for diabetic treatment. The various nervous symptoms had been regarded as due to the diabetes until the anemia was recognized. The diagnostic criteria for pernicious anemia have been the occurrence of recurrent glossitis, symptoms and signs of involvement of the central nervous system, achlorhydria, increased bile pigments in the plasma, with severe anemia of the inacrocytic type, together with absence of evidence after detailed study of any direct cause for the anemia, and finally rapid decrease of the anemia by the feeding of liver or a potent substitute.

It is notable that periods of exacerbation and severity in one disease usually were accompanied by a similar change in the other. Thus, in the Peter Bent Brigham Hospital case, as the patient developed severe acidosis a rapid increase in anemia occurred, the red blood cells falling in the course of a week from 3,800,000 to 1,900,000 per cubic millimeter. Adams noted in his first case that when the anemia was severe the patient was relatively resistant to insulin. The reverse occurred, however, in patient 10, in whom diabetes was well controlled with 20 units of insulin at the outset of treatment, yet six months later when the red blood count had increased from 2,100,000 to 5,140,000 per cubic millimeter the insulin dose had to be increased to 40 units. This increase in insulin took place without any increase in body weight and with an increase in diet of only 20 Gm. of carbohydrate, 21 Gm. of protein and 7 Gm. of fat.

Evidence of spinal cord changes sufficiently gross to be readily recognized and commented on occurred in fifteen cases. In case 5 the spasticity, ataxia and weakness were so marked in December, 1928, that the patient could not walk; yet with treatment consisting of 300 Gm. of liver, 50 grains (3.2 Gm.) of pills of ferrous carbonate and 15 units of insulin a day combined with muscle training under the direction of Dr. Mark Rogers, he left the hospital in three months walking without assistance and giving other evidences of marked improvement. Patient 6 presented a complicated picture. She had had definite transitory attacks of aphasia with hemiplegia and hemianesthesia. She had a speech difficulty, not definitely aphasic, but apparently a residual of her previous attacks. Prior to these attacks, however, she had had paresthesias, numbness and clumsiness of both hands with weakness, and both hands and legs

had been very cold. She had had attacks of vertigo with nausea and without tinnitus. Her memory for recent events was faulty and she was emotionally unstable. The spinal fluid examination was negative. She made a remarkable improvement in mental and neurologic symptoms with liver treatment and was doing well in July, 1930, nineteen months after she was first treated with liver.

Certain comparisons between the two diseases are of interest. Numbness and tingling found in the hands, feet and legs are common symptoms of both diseases. Yet in more severe stages of involvement of the central nervous system diabetes leads to pain and motor paralysis, whereas pernicious anemia is characterized by spasticity and ataxia associated with subacute combined sclerosis. The changes in the central nervous system due to diabetes, even when pain and paralysis have been present for long periods, usually respond to diabetic treatment, and the patient can be promised recovery.[11] The spinal cord lesions of pernicious anemia, when paralysis has occurred on the other hand, improve but rarely return to normal, even with most intensive treatment. Furthermore, during the active stage of diabetic "neuritis" (that is, pain, paralysis of one or more extremities and absence of reflexes) an increase in the total protein of the spinal fluid is often present. Diarrhea is undoubtedly a much more frequent symptom of pernicious anemia than of diabetes, but it is by no means rare in the latter disease, occurring, however, commonly in cases with free hydrochloric acid in the stomach, whereas in pernicious anemia free hydrochloric acid is always absent. Atrophy of the tongue in diabetes frequently produces a typically smooth tongue, but a true glossitis with soreness is rare.

Both diabetes and pernicious anemia tend to produce variations in the lipoid contents of the blood, dependent on the stage and severity of the disease. In severe or inadequately treated diabetes a great increase not only in cholesterol but also in lecithin, fatty acid and free fat of the blood occurs. Values as great as 500 to 800 mg. of cholesterol per hundred cubic centimeters return to a normal of 220 mg. or less, with improvement, and especially with treatment by means of insulin and a diet containing 100 Gm. or more of carbohydrate. Bloor [12] noted that the low plasma cholesterol in pernicious anemia improved later. Muller [13] studied the plasma lipoids of twenty-six cases of true pernicious anemia and eight doubtful cases and found that the abnormally low cholesterol values present during a relapse rose steadily with the onset of a remission. Lecithin values followed those of cholesterol. In a typical case the cholesterol varied between 60 and 70 mg. per hundred cubic centimeters before remission, but on the thirteenth day after beginning liver treatment, it reached a normal value of 135 mg.

Claude Bernard [14] first noted that the blood sugar rose in dogs after bleeding, but further observations on the blood sugar in anemia were not made for many years. The behavior of the blood sugar in pernicious anemia presents interesting variations. Johnson [15] found in sixteen cases of pernicious anemia that the fasting blood sugar was above normal and that the blood sugar was higher the lower the hemoglobin. Goudsmit reports eight dextrose tolerance tests using 50 Gm. of dextrose in five typical and three atypical cases of pernicious anemia. In four of the five typical cases and in one of the atypical cases the blood sugar rose above 0.17 per cent. Riddle [16] found a reduction in the fasting blood sugar of patients under treatment with liver extract during early remissions. He interpreted it as due not to an insulin-like substance in the extract but to a metabolic readjustment. Meulengracht and Iversen [17] studied twelve cases of pernicious anemia and found that in severe relapse a high fasting blood sugar occurred as well as an elevated and prolonged blood sugar curve after the ingestion of dextrose. They concluded that these deviations depend more on the intoxication underlying the condition than on the degree of anemia.

Cases of anemia difficult to classify as true pernicious anemia are not rare in the diabetic clinic. Two patients have already been mentioned who, during the course of a severe infection, rapidly developed pronounced anemia, in one of whom hydrochloric acid was absent in the stomach in a single test. In routine examination of blood smears which were checked by an expert hematologist, three cases out of eight were recognized without any knowledge of the patient's condition as probably having achlorhydria, because of suspicious changes in the red blood cells. Mild degrees of anemia are not rare in diabetes, particularly if the diabetes is active and uncontrolled. One wonders whether the absence of anemia among diabetic patients years ago was due to the heavy diets of meat or whether the anemia was not noticed. The fact that under these conditions acidosis and concentration of the blood frequently develop tends to obscure the anemia and so to allow such cases to go unrecognized. Minot [18] has discussed the existence of mild deficiency disorders in which, although a proper diet is fed, defective absorption or an abnormal gastro-intestinal function might result in mild symptoms. In the diabetic patient not only achlorhydria but also the existence of a dilatation and atony in the intestinal tract, especially of the colon, as Dr. L. B. Morrison has so often demonstrated as a result of the roentgenologic studies of patients, or of cholelithiasis, may contribute to a mild deficiency disorder expressing itself in mild anemia, neuritic paresthesias or more severe neuropathic states.

Chvostek [19] regarded chronic pancreatitis as a distinct factor in producing anemia. He reported three cases, in one of which there was diabetes, and discussed the literature with especial reference to hemochromatosis, and cirrhosis of the liver and of the spleen. Conceivably, as a result of the interference with pancreatic function, a disturbance of the plasma lipoids might result in such concentration of hemolytic lipoids as to cause anemia. Another possibility dependent on pancreatic disease, which he considered, was that some hemolytic substance might be derived from the abnormal gastro-intestinal mucosa. However, the ordinary evidences of severe pancreatitis, such as fatty diarrhea, starch in the stools, and emaciation have not been noted in the cases here described.

TREATMENT

The results of treatment, by means of liver and insulin have been uniformly good in my patients. The causes of failure so far reported have been the advanced condition in which the treatment was begun,

11. Root, H. F., and Rogers, M. H.: New England J. Med. **202**: 1049 (May 29) 1930.
12. Bloor, W. R.: J. Biol. Chem. **25**: 577 (July) 1916.
13. Muller, G. L.: Am. J. M. Sc. **179**: 316 (March) 1930.
14. Bernard, Claude: Leçons sur le diabète et la glycogénèse animale, 1877.
15. Johnson: Acta med. scandinav., 1922, supp. 3.
16. Riddle, M. C.: Ann. Int. Med. **3**: 1097 (May) 1930.
17. Meulengracht, E., and Iversen, Paul: Deutsches Arch. f. klin. Med. **148**: 1 (July) 1925.
18. Minot, G. R.: Ann. Int. Med. **3**: 216 (Sept.) 1929.
19. Chvostek: Wien. klin. Wchnschr. **5**: 121, 1918.

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the presence of severe complications or, in Wright's case, the development of polycythemia under treatment. Tillgren [20] had two deaths, one from diabetic gangrene and one from tuberculosis. Varga [21] reported good results consisting of improved appetite and strength in the treatment of pernicious anemia with insulin. Since the report of Blotner and Murphy [22] of the effect of feeding liver on the blood sugar, it has been hoped that diabetes could be treated in this way. However, Bowen [23] reports a case of combined pernicious anemia and diabetes in which no benefit was observed from the use of liver in controlling the diabetes, and in my cases of combined pernicious anemia and diabetes I could not prove that the liver reduced the insulin requirement. In fact, patient 10 during three months' observation on a diet in which the carbohydrate was gradually increased from 145 to 165 Gm. increased his insulin dose from 20 to 40 units. Patient 5, during three months' treatment in the hospital, received daily 300 Gm. of liver, half the amount raw and half the amount cooked. In spite of the improvement in symptoms of the central nervous system, no reduction in insulin requirement or lowering of his average blood sugar level was noted. However, it must be admitted that careful studies of this point were not made. The diet which was prescribed during the period in which he gained steadily and which is typical for the other cases in this group, is given in table 5.

TABLE 5.—*Diet of Patient 5* *

Egg, 1	20% cream, 180
Meat, 60 Gm.	Shredded Wheat, ½
Liver, 300 Gm.	Grapefruit, 200
5% vegetables, 500	Orange, 200 Gm.
Uneedas, 2	Peach, 165
Butter, 5	Apple, 165
	Liver extract, 2 vials (Lilly)
Carbohydrate	133 Gm.
Protein	99 Gm.
Fat	78 Gm.
Calories	1,630

* The patient was a man, aged 57, March 1, 1929. He weighed 131 pounds (59 Kg.). Insulin, 10 units, was given. The fasting blood sugar was 0.22 per cent.

In view of Muller's observations one cannot help but ask whether a low fat diet is proper in treating pernicious anemia and diabetes. Largely as the result of suggestions from Dr. George R. Minot, my patients have received diets planned to contain liberal amounts of vitamins. Thus, not only the vegetables, such as lettuce and carrots, and fruits, such as oranges, lemons, raisins and apricots, but also cod liver oil and yeast concentrate have been used.

The insulin dosage for the cases of combined diabetes and pernicious anemia in the Deaconess Hospital has varied from 5 units to a maximum of 42 units daily. No insulin reactions have occurred and no instance of insulin resistance has been observed.

SUMMARY AND CONCLUSIONS

1. A series of forty-eight cases of combined diabetes mellitus and pernicious anemia, including seven autopsies, was observed.

2. The symptoms of diabetes preceded the symptoms of anemia in the great majority of cases.

3. Factors predisposing to a more frequent combination of the two diseases are the greater duration of life brought about by improved treatment of each disease and greater interest in diagnosis.

4. Achlorhydria, which is frequent in diabetes and becomes more frequent with increasing age, may be an etiologic factor. Gastric analysis and examination of the blood for evidences of anemia should be performed on all diabetic patients and particularly searched for in cases of long duration.

5. Treatment by means of insulin, liver or a potent substitute, and a diet rich in vitamins gives good results.

81 Bay State Road.

20. Tillgren, J.: Acta med. scandinav., 1930, supp. 34, p. 86.
21. Varga: Paris méd. **2**: 249 (Sept. 21) 1929; abstr. J. A. M. A. **93**: 1844 (Dec. 7) 1929.
22. Blotner, Harry; and Murphy, W. P.: Effect of Liver on Blood Sugar Level, J. A. M. A. **92**: 1332 (April 20) 1929.
23. Bowen, B. D.: Comparative Effect of Liver and Liver Extract on Diabetes in a Case of Combined Pernicious Anemia and Diabetes, J. A. M. A. **95**: 30 (July 5) 1930.

ANTIPOLIOMYELITIS HORSE SERUM

ITS PREPARATION AND USE *

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In 1910, Flexner [1] reported an attempt to produce an immune horse serum against poliomyelitis as follows:

> It has, for instance, been found that the horse does not readily respond even to large injections of filtrates carrying the active virus with the development of immunity principles within the blood. It is true that our experiments are restricted to a single horse for the present, the blood serum of which, after many months of treatment, had no restraining effect on the virus either in vitro or within the body.

It is a known fact that not every horse responds readily with the production of immunity substances alike to every kind of antigen, so that several horses must be tried. This one experiment, therefore, did not discourage me. Then, again, another method might lead to success when this failed.

With this view in mind I enlisted the cooperation of Dr. Banzhaf, one of the assistant directors of the Research Laboratories of the Department of Health of the City of New York, who henceforth collaborated with me in all this work and is equally entitled to all the credit or the blame.

In August, 1916, we [2] began to inject a horse with trypsinized filtrates of cord and brain suspension of children that died of poliomyelitis. After twenty injections, we decided to continue with subcutaneous injections of 5 per cent suspensions containing the live virus without any trypsin and this method we have pursued throughout our entire work for nearly thirteen years. Brains and cords of monkeys that were successfully infected with poliomyelitis were used whenever human material was unobtainable.

The serum of this horse protected one monkey completely from an intracerebral inoculation of 0.5 cc. of a 5 per cent suspension of a very potent virus. This animal received nine daily injections of the serum, 3 cc. intraspinally and 17 cc. intramuscularly. Two monkeys were protected from intracerebral injections of a mixture of one part of virus suspension and two of the serum. The controls came down promptly with poliomyelitis and died. Their brain and cord presented the characteristic pathologic changes of the disease.

Thus we had good reason to believe that we had a horse serum that contained immunity substances sufficient to protect the animal by the restraining effect on the virus in vitro as well as in the body. By continued

* Read before the Medical Society of the County of New York, Academy of Medicine, Nov. 24, 1930.
1. Flexner, Simon: The Contribution of Experimental to Human Poliomyelitis, J. A. M. A. **55**: 1105 (Sept. 24) 1910.
2. Neustaedter, Marcus; and Banzhaf, E. J.: An Antipoliomyelitis Horse Serum, J. A. M. A. **68**: 1531 (May 26) 1917.

injections we were able to obtain a serum from this horse that neutralized virus in vitro in the proportion of two parts of virus and one of serum. Encouraged by these results we continued our work during the following thirteen years by inoculating three more horses with equally good results.

In 1918, a year after the publication of our work, August Pettit [3] reported our work and continued it along our lines with a sheep at first and then with a horse. He reported that his serum neutralized one part of virus with two parts of serum.

In 1928, Dr. Park was prevailed on to work on the problem. Our horse, which had been injected for ten months with virus of brain and cord that was inadvertantly preserved in an acid glycerin and later through animal experimentation discovered to be avirulent, was turned over to Dr. Park, who found that the horse had no neutralizing value at that time. With a known virulent virus then our method of treatment of the horse was mapped out by Banzhaf. By continuing the injections of our horse a very potent serum was obtained, Banzhaf having succeeded in concentrating it sufficiently to neutralize over 100 parts of the poliomyelitis virus in vitro. It is, of course, impossible to say how high the potency of our previous serums was, for we had no means to go on with our experiments in a more extensive manner. During the thirteen years of our work we were not able to procure monkeys in sufficient numbers to work on the problem in a manner extensive enough to test out every possible phase.

Clinically, the most gratifying results should be obtained in the preparalytic stage of the disease. With the ordinary methods of diagnosis at present in vogue one cannot be even reasonably certain of a correct diagnosis at this stage; it is guesswork at best even during an epidemic. In sporadic cases it is certainly impossible to diagnose poliomyelitis in the preparalytic stage. At this point I want to reiterate that the complement fixation of the spinal fluid of frank or suspected cases of poliomyelitis with our antigen is the only available means at present that is helpful in the diagnosis. In 1917 we [4] published the first results of our work on complement fixation with the specific antigen in acute poliomyelitis sufficiently gratifying to warrant the continuation of the work. It was done in collaboration with Miss M. A. Wilson of the research laboratories and has been sufficiently corroborated by other technicians since then.

The criterion of the efficacy of the serum, however, can be tested in frankly paralytic cases only, and this was amply demonstrated by the French clinicians and to some extent by us as well. Our experience is limited to six frankly paralytic cases in which we obtained most gratifying results—four of our own and two of Netter in Paris, to whom we sent 500 cc. of our serum six years ago. I regret to say that in spite of the positive experimental evidence in the last thirteen years at the research laboratories of the department of health of this city under the auspices of its director, Dr. Park, no opportunity was afforded us to test the value of the serum clinically. There certainly appeared from time to time cases of poliomyelitis in the Willard Parker Hospital and the serum was there always at their disposal. It is as harmless as ordinary horse serum or, for that matter, as any other antitoxin, so that no untoward effect could possibly be anticipated from it. It certainly is deplorable that the pioneer clinical work was left to Europe.

Pettit [5] reports the successful use of the serum clinically in twenty-five cases with frank paralysis, Netter [6] in twenty-two cases, Etienne [7] in several, and Minet and Porez [8] in four. Parouneix [9] relieved a bulbar paralysis and further on mentions a case of Stroup Beneck with a total paralysis of all four extremities and one of Debré with a bulbar paralysis as promptly ameliorated by the serum. Abroad it is used as Pettit serum.

A word may be said about the possibility of improving cases of frank paralysis. The pathologic changes characteristic of poliomyelitis in the acute stage consist chiefly of a reactionary inflammation of the cerebrospinal axis and in a small number of cases, of the peripheral nerves also. There is a perivascular infiltration of the meningeal, pial and parenchymatous vessels with mononuclears, polymorphonuclears, endothelial cells and plasma cells, together with a neuronophagocytosis. Edema is an early accompaniment. These changes may be slight and yet may produce extensive pareses. They may be regressive and the paralyses will disappear, as in some reported spontaneous recoveries, or they may become progressive and enhance degenerative changes of the nerve elements involved, producing permanent paralyses that defy all treatment. For this reason it is advisable to administer the serum in all cases, since it is clinically impossible to ascertain to what extent degenerative changes have set in. Of course, the earlier the serum is administered the better, and the ideal to be approached is to use it in the preparalytic stage, if and when a diagnosis can be made with any degree of certainty. Patients with a frank paralysis who still have fever should be treated. We know that some cases continue to improve even as late as up to two years.

As a further proof of the tenability of my theory may be cited a report of Netter [9] on the use of human convalescent serum in frankly paralytic cases. In 1910 he used the serum in a case of the Landry type with complete success, beginning the treatment forty hours after the onset of the paralysis; again in 1913 he reported a case of the Landry type beginning treatment fifty hours after the onset of the paralyses and continuing without pause. He not only arrested the progress but also produced a complete disappearance of a paraplegia with retention. In 1914 he reported a case of bulbar paralysis with strabismus, a facial paralysis and hemiplegia, treated with the human serum with a resulting complete recovery. In a later communication he cited Zingher's nine cases in 1916, Macnamara's (Melbourne) three cases and Marinesco's bulbar cases with complete recovery. Interesting are Salanier's three cases, reported by Netter, in each of which the paralyses appeared in saccades successively some days apart. In these patients the serum was used six or eight days after the onset with success.

METHOD OF HORSE SERUM THERAPY

The immediate effect of the administration of the serum in the monkey is not closely analogous to that in man, particularly when injected intraspinally. The monkey apparently stands the serum well when it is

3. Pettit, August: Compt. rend. Soc. biol., 1918, p. 1087.
4. Neustadter, Marcus; and Banzhaf, E. J.: Complement Fixation with a Specific Antigen in Acute Poliomyelitis, J. Infect. Dis. **21**: 514 (Nov.) 1917.
5. Pettit, August: Bull. gén. de thérap. **176**: 389, 1925.
6. Netter, Arnold: Sérothérapie dans le maladie de Heine-Medin, Paris, Masson & Co., 1928, p. 11.
7. Etienne, cited by Netter (footnote 6).
8. Minet, Jean; and Porez: Echo méd. du nord **31**: 575 (Oct. 29) 1927.
9. Cited by Pettit (footnote 5).

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injected daily intraspinally and intramuscularly at the same time. In man, however, intraspinal injections invariably produce violent reactions, characterized by a rapid rise of temperature up to 104 or 106 F., and at times even convulsions and coma. Pettit and others report similar experiences. The intravenous and intramuscular routes are practically devoid of any unpleasant effects if properly checked and are just as effective. The safest method to forstall an anaphylactic reaction is to inject the patient with one-fourth grain (16 mg.) of morphine and one one-hundredth grain (0.6 mg.) of atropine sulphate, and after several minutes to inject a few minims of the serum subcutaneously. If after ten minutes no reaction appears, it is safe to proceed with the intravenous or intramuscular injection of the serum.

The dose of the native (unconcentrated) serum for adults is from 20 to 30 cc. every twenty-four hours or on alternate days, depending on the severity of the case; the dose for children is, of course, less according to age. In a very severe case I have given 20 cc. intravenously twice in twenty-four hours with gratifying results. The dose may be continued daily until the temperature drops to normal, or longer when necessary until ten injections have been given. A Herxheimer reaction is the indication of the limit of safety. The combination of an intravenous and an intramuscular injection is advisable in the first two or three days in particularly severe cases. The concentrated serum can be given in 5 cc. doses. Intramuscularly it produces a Herxheimer reaction after the third dose; it seems to be better tolerated intravenously. Since it is possible to go further clinically with the native serum before a Herxheimer reaction is apt to set in, I prefer this to the concentrated. In my experience and that of foreign investigators, the intravenous and intramuscular routes are devoid of unpleasant reactions and yield gratifying results, so that the intraspinal method has been abandoned.

At this point I want to report an interesting case of poliomyelitis treated with the serum, because it is rather the unusual type.

F. L., a boy, aged 16, developed fever, Aug. 20, 1928. The following day the throat became congested and he vomited several times. In addition there were headache and general malaise. The temperature, which was not over 102 F., began to recede on the fourth day. Then weakness, pain and a tremor set in the right arm, so that he had to hold it in a sling. The tremor ceased after a few days but the arm grew constantly weaker and all the muscles of the right upper extremity and shoulder as well as of the scapula began to waste. He stated that he lost 15 pounds (6.8 Kg.) in two weeks.

November 3, when I first saw him, he presented the following symptoms: There was a fair degree of paresis in the entire upper right extremity and shoulder. He was unable to raise the arm or to resist passive motion to any appreciable extent, especially on flexion. All muscles of the right upper extremity, chest, shoulder and scapula were considerably atrophied and exhibited a partial reaction of degeneration. In spite of the fact that he still complained of pain, no tenderness could be elicited on pressure along the course of the peripheral nerves and the pin prick was felt equally well on the two sides. His temperature was then 100.2 F. by mouth. The pupils were rather sluggish to light but prompt to accommodation and in convergence. Otherwise he was neurologically normal.

Under usual precautions he received four daily intramuscular injections of 15 cc. of the native serum. The temperature became normal after the third dose. After the fourth dose, the motor power of the forearm began to improve. The following day he developed slight serum sickness, so no other serum treatment was instituted. The Herxheimer reaction was accompanied by a slight elevation of temperature, which promptly subsided under the influence of atropine.

Mild galvanism and massage three times weekly were then instituted and the boy continued to improve unremittingly. The electrical response to faradic current was equal to that of the left arm. I discharged him as completely recovered in January, 1929.

There is no doubt that the case was one of poliomyelitis involving not only the anterior horns of the cord but the posterior roots and ganglions as well and ran a subacute course with elevation of temperature. The prompt cessation of the continued wasting and decline of the motor power and the return of the temperature to normal after the treatment with the serum entitle me to assume that it was decidedly beneficial in this case.

SUMMARY AND CONCLUSIONS

The efficacy of our antipoliomyelitis horse serum and that of Pettit of Paris, who followed our method, was shown in more than sixty cases of frankly paralytic cases of poliomyelitis.

The earlier a case is diagnosed the better will be the result of the serum, if given early.

Cases presenting a chronic course with elevation of temperature should be afforded the benefit of the serum, which is as harmless as any other antitoxin. It can be standardized and obtained in large quantities and is always available.

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TRANSFUSION DONORS AS SOURCES OF IMMUNE SERUM FOR TREATMENT OF POLIOMYELITIS *

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Since human immune serum is the only available substance having a generally recognized specific therapeutic effect in poliomyelitis, and since to be effective it must be used early in the disease, it is of the greatest importance that adequate supplies of serum, preferably of known neutralizing value, be on hand, or at least that potential donors of such serum be quickly available. Every one who has dealt with the problem in the presence of an epidemic is familiar with the considerable difficulties in satisfactorily solving it. The majority of cases of poliomyelitis occur in children, many of them so young that only small amounts of blood can be obtained from each even as late as two years after convalescence. Hence, as a rule where pools of convalescent serum are kept on hand they are made up of small samples from various sources. As the basis for such practice it is assumed that nearly all convalescents from poliomyelitis carry the specific viricidal substances in their serums.

In a recent contribution, Shaughnessy, Harmon and Gordon [1] have shown how far short of the truth such an assumption may be. In only four out of seven persons who had been attacked by the disease from six months to two years before the test did the serum neutralize poliomyelitis virus. Such observations are in

* From the Department of Pediatrics, Stanford University School of Medicine.

1. Shaughnessy, H.; Harmon, P. H., and Gordon, F. B.: Neutralization of the Virus of Poliomyelitis by Human Sera, Proc. Soc. Exper. Biol. & Med. **27**: 742 (May) 1930.

harmony with earlier ones of Netter and Levaditi,[2] Taylor,[3] and others. Aycock and Kramer[4] in sixty tests with forty-one samples of convalescent serum, of which twenty-four were pooled lots from three or four individuals, had five failures. It is impossible to tell from their figures what proportion of convalescents were not immune, since most of the samples were pooled, but two of the individual samples and one pooled sample from three individuals failed to neutralize.

Shaughnessy and his associates confirmed and extended the earlier observations of Anderson and Frost,[5] Peabody, Draper and Dochez[6] and others that the serums of "normal" persons without history of previous attacks of poliomyelitis may contain immune bodies. They found that the serums of thirteen out of fifteen (87 per cent) such persons over 2 years of age were capable of neutralizing virus, eleven of them in serum dilutions of 1:30 and two of them possibly in dilutions of 1:200. Eight out of nine persons 12 years of age or over gave positive neutralizing tests, and the two highest titers in the entire series occurred in normal adults. Aycock and Kramer furnished the most exhaustive statistics on the point. In forty-six normal individuals of urban residence, thirty-two, or 70 per cent, neutralized virus; and of the thirty-four who were aged 5 years or older twenty-seven, or 86 per cent, neutralized. The neutralization of serums from individuals in rural communities was much lower. In a separate study[7] of twenty-one adults from a Southern city, eighteen, or 86 per cent, neutralized virus.

Two practical applications which logically follow these experimental observations would appear to deserve the attention of the medical profession, in view of the fact that poliomyelitis occurs nearly every year in epidemic form somewhere or other. First, since the serum of convalescents from the disease does not always possess viricidal properties, it is highly desirable to have all samples tested for such properties before they are used therapeutically. This is by no means as difficult in practice as appears to be generally thought. A laboratory equipped to handle monkeys and having a stock of standard virus can make such tests. The expense, with monkeys at about $15 apiece, is of course considerable, but it is not prohibitive. The testing might be considered a public responsibility and be carried out by the laboratories of state or municipal boards of health or, if done by private institutions, be paid for out of public funds. The cost can be reduced if donors capable of giving considerable amounts of blood repeatedly can be found, and this is the second point to be discussed.

It occurred to me that, since many normal adults possess viricidal substance in the blood, transfusion donors may in many cases prove to be suitable and convenient sources of therapeutic serum. If this is true, neutralization tests on listed donors could be made, immunes detected, their blood obtained for stocks of serum, and the problem of finding adequate, quickly available supplies for treatment would be solved. A list of donors for direct transfusion would be at hand if that procedure were desired in unusually severe cases.

To determine the practicability of the hypothesis, blood samples from four of the donors on the list of Stanford University School of Medicine were obtained and tested for viricidal value by Dr. E. W. Schultz, professor of bacteriology, who determined that three of the four serums possessed protective value and the fourth, none.[8] The details of his tests are shown in the accompanying table.

One of the donors belongs to group I, and two belong to group II of the Moss classification. In future tests we hope to find immune donors of the other two groups, and also to titrate the neutralizing values of the serum of our immune donors so as to be

*Neutralization Tests**

Control Serums		Human Serums Tested†			
Normal Monkey	Convalescent Monkey 176	Jo	Da	Pa	Bu
Monkey 227	*Monkey 228*	*Monkey 223*	*Monkey 224*	*Monkey 225*	*Monkey 226*
7/23, slight tremors; excitable; 7/24, tremors more marked; paralysis of both arms; partial paralysis of legs; 7/29, gaining strength; 8/15, recovered, except for residual paralysis; saved for convalescent serum	No evidence of poliomyelitis within a month	No evidence of poliomyelitis within a month	7/23, tremors, and excitable; 7/24, flaccid paralysis, both legs; 7/25, paralysis has extended to both arms; killed for virus material	No evidence of poliomyelitis within a month	No evidence of poliomyelitis within a month

* Results of tests for viricidal antibodies on the serums of four normal human adults. A weighed quantity of glycerinated cord and medulla of a poliomyelitis monkey, 211, was ground in the presence of carefully washed sterile sand for one hour in a Schultz-Banham grinder (Schultz, E. W., and Banham, F. D.: Description of a New Mechanical Disintegrator, Am. J. Pub. Health **20**: 771 [July] 1930) and made up as a 5 per cent suspension in physiologic solution of sodium chloride. A portion of this suspension was lightly centrifugated for ten minutes and then filtered through coarse, sterile filter paper. The filtrate was distributed in 1 cc. amounts to a series of serologic tubes. To these tubes the various serums to be tested were added in 1 cc. amounts, giving a final serum dilution of 1:1. The mixtures were incubated at 37.5 C. in a water bath for two hours and injected intracerebrally into Macacus rhesus monkeys, each monkey receiving 1.5 cc. of the serum-virus mixture. The injections were all made July 15, 1930.

† These serums were later retested with the same results indicated in the table.

2. Netter, A., and Levaditi, C.: Action microbicide exercée sur le virus de la poliomyélite aigue par le sérum des sujets antérieurement atteints de paralysie infantile: Sa constatation dans le sérum d'un sujet qui a presenté une forme abortive, Compt. rend. Soc. de biol. **68**: 855 (May 21) 1910.

3. Taylor, H. D.: Blood Counts in Experimental Poliomyelitis in the Monkey, J. Exper. Med. **29**: 97, 1919.

4. Aycock, W. L., and Kramer, S. D.: Immunity to Poliomyelitis in Normal Individuals in Urban and Rural Communities as Indicated by the Neutralization Test, J. Prev. Med. **4**: 189 (May) 1930.

5. Anderson, J. F., and Frost, W. H.: Abortive Cases of Poliomyelitis: An Experimental Demonstration of Specific Immune Bodies in Their Blood Serum, J. A. M. A. **56**: 663 (March 4) 1911.

6. Peabody, F. W.; Draper, G., and Dochez, A. R.: A Clinical Study of Acute Poliomyelitis, Monograph 4, Rockefeller Institute for Medical Research, June 24, 1912, pp. 15-18.

7. Aycock, W. L., and Kramer, S. D.: Immunity to Poliomyelitis in a Southern Population as Shown by the Neutralization Test, J. Prev. Med. **4**: 201 (May) 1930.

8. Since the manuscript of this report was submitted to THE JOURNAL, Professor Schultz has tested the serums of nine more of our transfusion donors and found seven of them immune. Thus, ten of thirteen (77 per cent) are immune, which is in fairly close agreement with the other series cited in the text. One serum neutralized in 1:60 dilution. In the recent California epidemic, our immune donors supplied more than 5 liters of blood for treatment, in a few cases by transfusion.

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able to select for therapeutic purposes those having the highest concentration of antibodies.

As the result of the tests made on these four persons, three potential donors of antipoliomyelitis serum of established value were found who can on a moment's notice furnish sufficient blood or serum to treat a very considerable number of patients. This is an obvious gain over the present method of depending on pooled stocks or individual convalescents' blood of unknown value. It is highly probable that the antibody content of pooled serum is frequently lowered by the inclusion of samples of no value, and individual untested samples (or even pooled samples, as shown by Aycock and Kramer) may contain no antibodies at all.

The following suggestions are made:

1. It is advisable to test for viricidal properties those samples of human serum intended for the treatment of poliomyelitis. Pooled serums may have low or inadequate amounts of immune antibodies, owing to the inclusion of nonimmune serums and consequent dilution of the immune fractions. The tests, though expensive, are entirely practicable.

2. State or municipal boards of health might be charged with the duty of making such tests or of defraying the expenses when performed by such private agencies as properly equipped private research institutions.

3. Adult transfusion donors are frequently immune to poliomyelitis, and their blood, when tested and found to contain viricidal properties, forms an abundant and readily available source of serum for treatment. The testing of transfusion donors for such immune properties whenever and wherever possible is strongly urged.

4. The availability of transfusion donors for the treatment of poliomyelitis suggests the possibility of using large amounts of immune blood by direct transfusion in severe cases as a means of obtaining prompter and more thorough therapeutic action than is afforded by intramuscular or intrathecal injection.

THE EXTRACTION, DISTRIBUTION AND ACTION OF TESTICULAR HORMONES *

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Although experimental and clinical evidence as to the effects of castration, as well as numerous experimental transplantation studies, conclusively prove that the testes possess one or more endocrine functions, nevertheless the biochemical evidence for the extraction of a postulated hormone from testis tissue was not definitely established until recently. To be sure, numerous claims have been made from time to time, only to be unconfirmed later.

Brown-Séquard [1] is credited with the preparation of the first extract. He prepared crude water extracts from dog and guinea-pig testes and claimed most remarkable effects from the subcutaneous administration of them on himself. He felt much improved in general, with greater capacity for physical and mental work and less need for laxatives. The general impression was that the subcutaneous injection of the product would prove beneficial in the treatment of the aged and of persons with neurasthenia. Later the product was improved [2] and stabilized by the use of glycerin as a preservative and by autoclaving or filtering through a porcelain filter. Nevertheless, the product remained an exceedingly crude preparation containing numerous tissue constituents in much lower concentrations than in the fresh tissue. The dilution introduced in the mode of preparation was always at least tenfold. In the light of present knowledge it is doubtful whether the Brown-Séquard preparation could have contained a sufficient amount of the one hormone now recognized as stimulating the secondary sex characters and accessory gonads to have influenced such elements in the clinical observations made by him and others. Brown-Séquard himself never stated that his product influenced the secondary sex characters but that probably two physiologic effects could be expected from his preparation: first, a prompt dynamic action, and secondly, but later, that of "activating nutrition." He also emphasized the possibility of suggestion or idiosyncrasy being factors in his case and expressed his desire to have other physicians confirm his observations. In general it seems necessary to conclude that such confirmations have been so few and the negative results so numerous that at present Brown-Séquard's assertions are not taken seriously. The best partial laboratory confirmations of his statements were given by Zoth [3] and by Pregl,[4] who by means of ergographic records on themselves as well as on others found that the glycerin Brown-Séquard preparations did increase muscular efficiency and delayed the onset of muscular fatigue. Proper controls on glycerin were made, but similar extracts prepared from other tissues than testes were not tried. Zoth and Pregl used preparations supplied by a commercial laboratory. Dixon [5] reported that saline extracts from fresh testis tissue cause a fall in blood pressure and a slight stimulating action on involuntary muscles. It is obvious that the Brown-Séquard preparations used were extremely crude and it is not at all unlikely that some of the effects observed were due to vasodilatins that could easily have been obtained from other tissues as well. A specific hormone action certainly was not demonstrated.

Among those who reported influencing secondary sex characters by extracts similar to the Brown-Séquard preparations are Ancel and Bouin [6] and Walker.[7] The former prevented atrophy of the penis and seminal vesicles in castrated guinea-pigs with subcutaneous injections every two days, while the latter caused comb and wattle growth in hens by the injection of saline extracts from cockerels' testicles. The doses employed by these observers are very small as compared with present practice for it is now found necessary to inject daily the equivalent of at least 50 Gm. of testis tissue to cause a measurable comb growth in five days in capons.

Poehl's spermine was the next product for which remarkable therapeutic values were claimed. Although first discovered by Leeuwenhoek [8] in 1678, rediscovered by Vauquelin in 1791 and then studied in more detail by Schreiner [9] and by Ladenburg and Abel,[10] it was not

* From the Department of Physiological Chemistry, University of Chicago.

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2. d'Arsonval, A.: Arch. de physiol. norm. et path. **26**: 172, 1894.
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4. Pregl, Fritz: Arch. f. d. ges. Physiol. (Pflüger's) **62**: 379, 1896.
5. Dixon, W. E.: J. Physiol. **26**: 244, 1900.
6. Ancel, P., and Bouin, A.: Compt. rend. l'Acad. de Sc. **142**: 232, 1906.
7. Walker, Proc. Roy. med. Soc., Path. Section **1**: 153, 1906.
8. Leeuwenhoek, Phil.: Tr. Roy. Soc. **12**: 1042, 1678.
9. Schreiner: Ann. d. Chem. u. Pharm. **194**: 68, 1878.
10. Ladenburg, A., and Abel, J.: Ber. d. deutsch Chem. **21**: 758, 1888.

until von Poehl [11] investigated it that its catalytic oxidative action was claimed, as a result of which it was introduced clinically. It is now known that spermine is widely distributed and that the claims as to its physiologic action have not been satisfactorily confirmed. Through the work of Rosenheim, Dudley and Starling,[12] as well as the studies by Wrede,[13] the structure of spermine is now known to be that of a symmetrical bis-aminopropylamine butane. Its synthesis demonstrates its formula to be NH_2-$(CH_2)_3$-NH-$(CH_2)_4$-NH-$(CH_2)_3$-NH_2. Spermine obviously does not fulfil the postulated characteristics as to distribution and physiologic action of a testis hormone.

Iscovesco [14] studied the lipin fractions obtained from ovaries and testes and concluded that a certain fraction from the latter when injected in doses of 0.01 Gm. per kilogram of body weight caused in the normal rabbit in from two to three months an hypertrophy of the testis and slightly higher weights for the kidney, thyroid and whole body as compared with controls, while in man he observed "effects which could be interpreted as resulting from a similar stimulating action." He actually attempted to fractionate his material but his biologic basis for the detection of his potency is very unsatisfactory and unreliable.

Pezard [15] was the first to use the capon as a test animal for the hormone affecting secondary sex characters and reported that when the equivalent of "one tenth of a cryptorchid hog testis" is injected twice weekly into an Orpington capon one observes a growth of comb, wattles and ear lobes as well as a more masculine behavior. As he did not describe his method of extraction he may have employed a suspension of testis tissue. His dosage also appears unusually low. The same is true of Ssentjurin,[16] who reported that he retarded regression of comb size in capons by injection of the Locke's solution perfusates from bulls' testicles. He even states that by means of the Lichtgrün Manoiloff test one can determine the relative concentration of the active substance in the perfusate. This is extremely doubtful.

Korenchevsy and Carr [17] reported that the injection of "testis emulsions" causes an increased nitrogen metabolism in "most dogs" and that an insulin-like action can be shown to be present in testis and kidney tissue extracts which lowers the nitrogen metabolism in thyroidectomized, normal and castrated rabbits. Their figures are by no means convincing.

The foregoing review of the work prior to 1926 on extracting the testicular hormone clearly shows that the experimenters either employed very crude modes of extraction or that the biologic response used was of extremely doubtful value. In most cases the experimenter not only attempted to interpret an exceedingly doubtful biologic response, but in addition he employed a crude product. The first report giving clear cut evidence of extracting and fractionating the hormone from testis tissue was given by L. C. McGee [18] who repeatedly obtained a lipin fraction from bulls' testis tissue which, when injected into brown Leghorn capons, produced marked growth of comb, wattles and ear lobes, and, when injected into the castrated guinea-pig, prevented the usual atrophy of the seminal vesicles. Subsequently he, and Gallagher in collaboration with C. R. Moore and his students,[19] showed that the same extracts previously standardized on the capon also correct the cytologic and other accessory gonad changes observed in the castrated rat and guinea-pig. Independently Loewe and Voss,[20] using the regeneration of the seminal vesicle of the castrated mouse as a test, arrived at similar conclusions and also reported finding the same substance in adult male human urine. Subsequently Funk, Harrow and Lejwa [21] also found the comb growth stimulating substance in urine and still later in testis tissue.[22] The application of the mouse seminal vesicle regeneration test has also been independently carried out by Martins and Rocha e Silva.[23] These numerous confirmations, together with later reports by still others,[24] definitely establish a method for extracting from testis tissue at least one hormone which affects certain secondary sex characters in the capon and in the castrated mouse, rat and guinea-pig.

EXTRACTION OF THE HORMONE

The method as devised by McGee, Gallagher and Koch [25] is briefly as follows: The testes, after being freed from epididymides and tunics, are finely hashed and extracted for three or four days at room temperature with from 3 to 4 volumes of 95 per cent alcohol. The alcoholic solution obtained is concentrated under diminished pressure until an aqueous emulsion or suspension of lipins is obtained. This is then repeatedly shaken with equal volumes of benzene and the combined benzene extracts again evaporated under diminished pressure. The resulting lipin mixture is next dissolved in acetone and cooled to 10 C. The clear acetone solution is separated from the inert precipitate and again evaporated under diminished pressure. The product thus obtained can be further purified by partition between hexane and various percentages of alcohol in water, resolution in ether, and shaking the ether solution with aqueous sodium bicarbonate, sodium hydroxide and acids. The final product can be made to be of an activity such that from 0.01 to 0.03 mg. daily causes an appreciable comb growth in a capon in five days. One milligram of such an extract represents from 12 to 18 pounds of testis tissue. This low yield is not due to loss or destruction of a great amount of the substance in the process of purification but to the extremely low concentration of the hormone in testis tissue. To bring about a measurable comb growth response in five days in a brown Leghorn capon, the extract from 50 to 75 Gm. of fresh tissue must be injected daily. It is because of this low concentration that the observations of earlier workers with amounts

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14. Iscovesco, H.: Compt. rend. Soc. de biol. **72:** 858, 1914; **75:** 445, 1914.
15. Pezard, A.: Comp. rend. Acad. d. sc. **153:** 1027, 1911.
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23. Martins, T., and Rocha e Silva, A.: Instituto Oswaldo Cruz, 1929, number 9, p. 192.
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25. Gallagher, T. F., and Koch, F. C.: J. Biol. Chem. **84:** 495 (Nov.) 1929.

equivalent to from a thousandth to a hundredth of our doses seem of doubtful value. The low yield has been a matter of considerable concern to this laboratory, but all attempts to improve it by reextraction or by acid, alkaline or enzyme hydrolysis prior to extraction have not succeeded.

DISTRIBUTION OF THE TESTICULAR HORMONE

Every testis tissue thus far examined by this laboratory yields some activity. Hog and bull testes uniformly yield active extracts, but rams' testes vary considerably in their content, the yield usually being lower than from bull testes, and sometimes the results are negative. In the case of rams' testes the variation may be seasonal.[24] Comparative studies on cattle testes indicate that the embryonic and calf tissues are richest in hormone content, with adult bulls somewhat less and old bulls least potent. No other bull tissue examined except epididymides yielded active preparations in the hands of Gallagher. Cows' ovaries also gave negative results in his hands.

As previously stated, Loewe and Voss and Funk, Harrow and Lejwa reported finding the hormone in adult human male urine. This laboratory has confirmed these observations. Funk, Harrow and Lejwa reported the daily rate of excretion as distinctly higher in mature than in old men. Womack and Koch[27] find that the hormone is either absent or present in thus far undetectable amounts in the urine from boys under 10 years or from young calves under 2 years of age, while in the urines from adolescent boys or mature men the amount present is appreciable. It is present in approximately one-half the concentration found in bulls' testes. We have also found the comb growth stimulating hormone in the urine from mature (pregnant or nonpregnant) women in concentrations of the same order as in men's urine. The negative observations on boys' and calves' urine may possibly be interpreted as indicating that the hormone is not secreted as rapidly before puberty as later. It certainly is present in the embryonic and in the prepubertal testes but it does not appear to escape into the urine before puberty. The source of the hormone in women's urine remains to be determined. At the present writing our quantitative studies indicate that the normal adult man or woman is excreting an amount of hormone every twenty-four hours equivalent to approximately one pound of bulls' testis tissue. If these observations are correct and the source of the hormone in the case of the male is the testes only, it must be concluded that this tissue is elaborating the hormone at a relatively rapid rate. The hormone has also been found in blood[28] and in the male blossoms of the pussy willow.[29]

MODE OF ADMINISTRATION OF THE HORMONE

In the experimental studies of this laboratory as well as in our cooperative investigations with the Whitman Laboratory and with Professor Moore in the department of zoology we have obtained the most uniform and successful responses from the subcutaneous or intramuscular injection of our preparations dissolved in olive oil. The same preparations when given by mouth with or without olive oil, saponin or proteins led to irregular results even though ten times the injection dose was fed. The material appears to be poorly absorbed from the intestinal tract because an appreciable amount is found in the feces after such a feeding experiment.

CONCLUSIONS

Active preparations of a testis hormone have been concentrated to a fair degree of purity. The product acts best when injected subcutaneously or intramuscularly; the dose for action by mouth is at least ten times as high. The physiologic actions observed thus far are the effects on the secondary sex characters in the capon and the accessory gonads in the mouse, rat and guinea-pig. No claim can be made that the product also affects behavior, metabolism or "vigor." Whether these responses are due to other hormones or whether larger doses over longer periods of treatment are involved remains to be determined.

In the light of these results on animals, it is reasonable to expect that similar generalizations will hold with reference to man. Thus far there is no indication that this product can be of any value in restoring "vigor" to the aged or neurasthenic. However, if there is an indication for its use and if the dosage in man is comparable to that found in the capon, the daily injection for a 150 pound man would have to be an amount equivalent to at least 5 pounds of bulls' testes tissue or 2 gallons of normal male urine. If taken by mouth, the dose presumably would have to be much greater. These deductions, based on animal experimentation, indicate the probable fallacy of prescribing testis preparations to man. It must be recalled that most of the proprietory preparations now on the market are to be taken by mouth and that they simply are made up of the desiccated and defatted ram or bull testicles. In the defatting process, no doubt a considerable part of the trace of hormone originally present is removed and discarded. The recent report from this laboratory on a well known proprietary product confirms these statements.[30]

26. Gallagher, T. F.: Am. J. Physiol. **87**: 447 (Dec.) 1928. Womack, E. B., and Koch, F. C.: To be published.
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ETHER HYPERGLYCEMIA

WITH ESPECIAL REFERENCE TO HEPATIC DISEASE *

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The occurrence of hyperglycemia during and following ether anesthesia is well known and is one of the physiologic phenomena associated with that state. It is one of the striking manifestations of the effect of ether on carbohydrate metabolism. Mekie and Miller [1] reported elevations of blood sugar following ether anesthesia of varying duration; the degree of elevation varied from 27 mg. per hundred cubic centimeters in 30 minutes to 47 mg. in 110 minutes, a rise of as much as 62 mg. being noted in some patients after 60 minutes. The amount of increase bore no relation to the nature of the operative procedure, although it was greater in laparotomies than in extra-abdominal operations. Similar observations have been made by Mackay,[2] Ross and Davis [3] and many others, values as

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3. Ross, E. L., and Davis, L. H.: The Rôle of the Pancreas in Hyperglycemia from Ether, Am. J. Physiol. **53**: 391 (Oct.) 1920.

high as 400 mg. per hundred cubic centimeters having been observed in prolonged anesthesia in individuals with normal carbohydrate metabolism.

There are, in the main, two theories that have been advanced in explanation of ether hyperglycemia. Ross and Davis [3] believe it to be due to depression of the internal secretory function of the pancreas (hypoinsulinism), a temporary disturbance analogous to diabetes mellitus. The similarity to diabetes extends also to disturbances of fat metabolism and acid-base equilibrium. Bloor [4] demonstrated an associated lipemia and acidosis; the ketonuria that follows ether anesthesia is a matter of common knowledge. Mahler [5] reported a progressive rise in plasma cholesterol, roughly proportional to the quantity of ether administered. It was found that both hyperglycemia and hypercholesteremia could be prevented by the administration of 10 units of insulin two hours prior to the induction of anesthesia.

The belief in pancreatic depression as the cause of ether hyperglycemia is not generally accepted. It is more probable that the rise in blood sugar is the result of increased hepatic glycogenolysis due either to the direct action of the anesthetic or to the increased hydrogen ion concentration associated with ether anesthesia. Investigations of phosphate metabolism are of great importance in this connection. Bolliger [6] found that in dogs the serum inorganic phosphate concentration dropped from 4.0 to 2.6 mg. per hundred cubic centimeters at the end of one hour of anesthesia and was 1.0 mg. one hour after the anesthetic had been discontinued. This observation is identical with the investigations made following the administration of dextrose, epinephrine or insulin, and appears to be due to the increased utilization of dextrose induced by those agents. Such changes would suggest that anesthesia hyperglycemia, as in the case of epinephrine hyperglycemia, is dependent on increased hepatic glycogenolysis rather than on hypo-insulinism.

Potter [7] found the inorganic phosphate of the serum to be increased in five of seven patients during anesthesia, and Stehle and Bourne,[8] making similar observations, suggest that the diminished alkali reserve and increased acidity may be due to a discharge of phosphoric acid from the muscles. Haldane, Wigglesworth and Woodrow [9] showed that the rise which may occur in serum phosphate is probably due to excessive muscular exercise and pure asphyxia and is not related to alteration in carbohydrate metabolism. According to Bolliger,[6] the drop in serum phosphate that normally occurs is not observed in depancreatized dogs, another indication of the importance of proper pancreatic function in the production of this phenomenon. By direct methods, a reduction in the glycogen content of the liver following ether anesthesia has been demonstrated by Macleod and Pearce [10] and Rosenthal and Bourne [11] found that hepatic function was diminished after anesthesia. In view of these and similar observations, it appears likely that the hyperglycemia of ether anesthesia is a result of the liberation of dextrose from glycogen stored in the liver.

The appreciation of this phenomenon is of great practical importance in connection with the preoperative and operative management of patients with obvious or presumptive disturbance of hepatic function. Injury to the liver, whether caused by hepatic poisons, infection or extrahepatic obstruction with biliary stasis, is associated with a diminution in the ability of the liver to store glycogen and with a coresponding decrease in its glycogen content. This has been demonstrated in several ways by Markowitz,[12] Olmstead and Coulthard,[13] Brill and Fitz-Hugh,[14] Kugelmann [15] and Ravdin.[16] Conversely, the ability of the liver to withstand injury is to a certain degree dependent on its glycogen content. This has been demonstrated experimentally by Davis and Whipple,[17] Umber [18] and Ravdin.[16] It is evident, therefore, that the effect of ether, which depletes the hepatic glycogen reserve, on a liver already poor in glycogen, may be productive of serious consequences.

PRESENT INVESTIGATION

The present study consists of the determination of the venous blood sugar concentration at brief intervals during operation, under ether anesthesia, on eight patients with disease of the biliary tract and four patients with other conditions (pyonephrosis, subacute appendicitis, gastric carcinoma, lymphosarcoma with pancreatic metastasis). The detailed observations are presented in the accompanying table.

Venous Blood Sugar at Brief Intervals During Anesthesia with Rise per Ounce of Ether Administered in Each Case

Case	Condition	Icterus Index	Blood Sugar, Mg. Minutes of Anesthesia 0	10	20	30	40	50	60	Ether, Ounces	Rise per Ounce, Mg.
1	Cholecystitis, hepatitis, stones	56	70	69	73	68	80	80	...	14	0.7
2	Cholecystitis, pylephlebitis	60	150	...	186	...	...	200	207	10	4.7
3	Cholecystitis, stones	64	118	132	150	187	176	...	...	15	3.9
4	Cholecystitis, stones	12	111	...	187	200	...	247	...	15	9.0
5	Hydrops of gall-bladder, stones	5	112	144	175	...	198	...	208	19	5.0
6	Cholecystitis	7	94	170	171	192	193	211	...	14	8.4
7	Cholecystitis	9	110	200	206	216	218	...	...	13	8.3
8	Cholecystitis	10	82	...	91	...	...	108	108	15	8.3
9	Gastric carcinoma	3	92	...	144	151	...	162	...	12	5.8
10	Appendicitis	..	100	...	115	152	...	...	...	6	8.7
11	Pyonephrosis	..	116	153	190	212	200	...	...	10	8.4
12	Lymphosarcoma involving pancreas	..	150	143	172	...	...	...	..	5	4.4

The fasting blood sugar level was within normal limits (Folin-Wu) except in case 2 (chronic cholecystitis, pylephlebitis, multiple liver abscesses, 150 mg.) and case 12 (retroperitoneal lymphosarcoma with pancreatic metastasis, 150 mg.). Frank jaundice was present in three of the eight patients with disease of the

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biliary tract. A point of striking interest and significance is the finding that in the jaundiced patients the rise in blood sugar per ounce of ether administered was 0.7, 4.7 and 3.9 mg., respectively, with an average rise of 2.9 mg. per hundred cubic centimeters per ounce, whereas in the patients with latent or no icterus the rise was 9.0, 5.0, 8.4, 8.3 and 8.3 mg., respectively, the average rise being 7.6 mg. per hundred cubic centimeters per ounce of ether. The average rise in the three patients without any biliary tract disease was 7.0 mg. per hundred cubic centimeters per ounce of ether administered.

All the patients in this series made good postoperative recoveries with the exception of patient 1, who died eighteen hours after operation, the autopsy revealing extensive acute diffuse necrosis of the liver, no evidence of which had been noted at operation. From the standpoint of studies of hepatic function prior to operation, this patient differed in no respect from the others with frank icterus. Unfortunately, the epinephrine test was not performed. This might have revealed the deficient glycogen reserve of the liver in case 1, for, as is noted in the table, the blood sugar concentration remained practically unchanged during the period of anesthesia. All patients with biliary tract disease received the same preoperative treatment, including a diet high in carbohydrate with supplementary dextrose therapy. Their general condition was good during operation. The blood sugar level appeared to bear no relation to the nature of the surgical procedure or to the manipulation of individual organs during the course of the operation.

COMMENT

These observations emphasize the importance of the glycogen content of the liver in determining the operative risk in patients with hepatic disease. It is evident that the glycogenic function of the liver is impaired in patients with jaundice, even though the commonly employed tests of the carbohydrate metabolic function of the liver fail to reveal any significant disturbance. The fatal result in one case of this series illustrates the extreme difficulty of determining, preoperatively, the extent of hepatic insufficiency in this respect. So far as could be determined, this case differed in no essential from two others with higher grades of bilirubinemia; however, the failure of the blood sugar to rise under the influence of ether is sufficient indication of the fact that the hepatic glycogen content was extremely low and foreshadowed the eventual and inevitable outcome.

Although the individuals with biliary tract disease without frank jaundice exhibited a hyperglycemic response equal to that of patients without hepatic damage, it must be recalled that they received careful preoperative treatment designed to decrease biliary stasis, combat hepatic toxemia and increase the storage of glycogen in the liver. The fact cannot be too firmly stressed that all patients with disease of the biliary passages must be regarded as having some degree of hepatic injury. Because of the relatively great functional reserve and enormous regenerative capacity of the liver, this can rarely be demonstrated until it becomes advanced. However, even in the absence of jaundice, the added insult of ether anesthesia may, by depleting an already diminished glycogen reserve, result in a stormy convalescence or a fatal issue. It is essential therefore that, so far as is possible, every effort be made to ensure an adequate hepatic glycogen content before operation on such patients.

SUMMARY AND CONCLUSIONS

The hyperglycemia associated with ether anesthesia is apparently due to increased hepatic glycogenolysis.

The average rise in blood sugar per ounce of ether administered was 2.9 mg. per hundred cubic centimeters in a series of patients with frank icterus as compared with 7.6 mg. in a series of patients with biliary tract disease without jaundice. Prior to operation, all had received a diet high in carbohydrate with supplementary dextrose therapy.

One patient, receiving 14 ounces of ether, failed to show any appreciable rise in blood sugar (0.7 mg. per hundred cubic centimeters per ounce of ether) and died eighteen hours after operation. Autopsy revealed extensive acute diffuse necrosis of the liver which had not been present at the time of operation. Preoperative studies of liver function in this patient did not differ in any essential from those in the other jaundiced patients who exhibited definite although subnormal hyperglycemic responses and who made uneventful recoveries.

All patients with biliary tract disease should be regarded as having hepatic damage whether or not evidence of hepatic insufficiency is demonstrable.

2009 Pine Street.

Clinical Notes, Suggestions and New Instruments

TULAREMIA FROM THE FOX SQUIRREL: REPORT OF CASE

TOM KIRKWOOD, M.D., LAWRENCEVILLE, ILL.

As an evidence of the increasing distribution of *Bacterium tularense* infection in animals, I am reporting a new animal host—the fox squirrel. According to a personal communication from Dr. Edward Francis, the case to be reported is the first traceable to that source.

Mrs. J. K., aged 28, a farmer's wife, whose past history and general examination were negative, skinned and dressed a fox squirrel, Aug. 18, 1929. She did not handle or come in contact with any other game on that date. There had been no other possible chance for exposure during the preceding month. She had not been bitten by any insect. She was in excellent health August 18, and no signs of infection appeared until August 20, when she had a severe chill accompanied by headache, backache and nausea. This chill was followed by an illness that lasted for four weeks. During this time she had chills, sweats and severe headaches; she lost several pounds and was left in an exhausted condition. On the third day of the infection she noticed that the glands under the right arm were enlarging, and she soon had much pain and tenderness in that region. A day or so later she discovered a small papule on the dorsum of the distal phalanx of the third finger of the right hand. As the disease progressed, this papule ulcerated and showed all the characteristics usually found in the initial lesion of the ulceroglandular type of tularemia.

The patient was certain that she had "blood poisoning" when I first examined her, August 31. She had consulted another physician, who was well acquainted with the symptoms of tularemia and who, suspecting that disease, had sent a specimen of blood to the state laboratory for the usual agglutination test. The report on this specimen was negative. As all the typical clinical signs associated with tularemia were present when I first examined this woman, another specimen of blood was sent to the laboratory. This sample, which was taken on the eleventh day of the disease, was also negative. Another specimen submitted on the seventeenth day showed a positive agglutination for *B. tularense*, but the report from the state laboratory, under date of September 9, did not give the titer. A blood specimen was next sent to the Hygienic Laboratory of the U. S. Public Health Service, Washington, D. C. The report from there,

dated September 30, showed a positive agglutination for *B. tularense* in a dilution on 1:1,280, confirming the report from the state laboratory.

Dr. Edward Francis, in the personal communication already referred to, states that this is the second case that has come to his attention of tularemia traceable to a "tree" squirrel. The first was contracted from a black squirrel in Kansas, in the latter part of November, 1928. These cases show conclusively that the tree squirrels must be considered as one of the possible sources of *B. tularense* infection. The fox squirrel is found in large numbers throughout various parts of the United States, and, from the standpoint of the hunter of small game, is one of the important game animals. The possibility of *B. tularense* infection in those who kill and dress these animals must therefore be remembered.

West State Street.

A CASE OF LEIOMYOSARCOMA OF THE STOMACH *

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Assistant Professor of Medicine and Assistant in Medicine, Respectively, University of Cincinnati College of Medicine
CINCINNATI

A white man, aged 50, a truck driver, was admitted to the medical service of the Cincinnati General Hospital, March 26, 1930, complaining of chills and fever of five days' duration. The chills had been occurring daily and were followed by profuse sweating. After the first rigor he experienced a severe pain in the left epigastrium. He felt a swelling there, which had remained unchanged in size.

There had been no previous abdominal pain and no digestive disturbances other than occasional flatulence and eructation of sour material. The bowels were usually constipated. A penile lesion had been present twenty-five years before, which was thought to be a chancre. When 10 years old he had chills and fever, which disappeared after the administration of quinine. He had received numerous intramuscular injections in the hips.

The patient was somewhat undernourished but did not appear acutely ill. There was a subicteric tint to the skin and sclerae. The pupils were unequal, were irregular, and reacted sluggishly to light. The fundi were normal. There was no generalized lymphadenopathy. The heart and lungs were normal. The blood pressure was 98 systolic and 68 diastolic. There was some fulness in the left hypochondrium. A firm mass presenting a distinct edge and descending freely on inspiration was felt to extend four fingerbreadths below the left costal margin in the midclavicular line. The mass was somewhat tender and smooth, save for a slight irregularity near its edge. It was thought to be an enlarged spleen. There was neither ascites nor detectable enlargement of the liver. The extremities and reflexes were normal.

A blood count showed 20,000 white cells with 89 per cent neutrophils, 6 per cent lymphocytes, 4 per cent large mononuclear and transitional cells and 1 per cent eosinophils. Red cells numbered 4,500,000 per cubic millimeter. The hemoglobin was 55 per cent (Dare). Some achromia was present; no malarial parasites were found. The urine was normal save for the presence of 1 + albumin. The blood Wassermann test was negative. Blood sugar was 105 mg., urea 13 mg., and uric acid 1.7 mg. per hundred cubic centimeters. The serum bilirubin was not increased: 0.2 mg. per hundred cubic centimeters indirect (van den Bergh technic). The erythrocytic fragility was normal. The platelets numbered approximately 490,000 per cubic millimeter; reticulocytes, 2 per cent.

Shortly after admission, the patient began to complain of sharp epigastric pain, nausea and vomiting. The temperature, which on admission was normal, rose to 103.2 F. with a corresponding increase in the pulse rate.

A fluoroscopic examination of the gastro-intestinal tract, much to our surprise, revealed the presence of a large irregular niche on the lesser curvature of the stomach, several inches above the pylorus, which Dr. H. G. Reineke interpreted as a subacutely perforating gastric ulcer and which he felt was related to the mass thought to be the spleen.

Exploratory laparotomy was performed by Dr. Malcolm Cook. A tumor mass was felt on the posterior wall of the stomach extending upward to the lesser curvature. As the lesser peritoneal sac was bulging, it seemed probable that perforation had occurred. Incision through the gastrocolic omentum revealed a large amount of foul-smelling pus, which was drained. The spleen was found to be normal in size and consistency. Following the operation the patient's course was steadily downward, and death occurred four days later.

At necropsy, Dr. J. N. Patterson found several small ragged sinuses on the lower posterior wall of the stomach communicating with the lesser peritoneal sac, which contained a walled off abscess. The sinuses were traced further and found to lead into an irregular shaped cavity, resulting from necrosis of the posterior wall of the stomach. Along the lesser curvature near the pylorus, the gastric mucosa was thrown up into a large irregular mass in the center of which there was an ulcer 7 mm. in diameter which communicated with the cavity in the posterior wall. The edges of the ulcer were found to consist of tumor tissue. There was an area of recent ulceration in the mucosa of the midportion of the posterior wall, which also communicated with the cavity. Microscopic examination of the tumor tissue proved it to be leiomyosarcoma, involving the various layers of the stomach wall. A metastatic nodule approximately 5 cm. in diameter was present on the anterior superior surface of the left lobe of the liver and a second, 1 cm. in diameter, in the lower lobe of the right lung posteriorly.

This case is of interest because (1) leiomyosarcoma of the stomach is relatively infrequent, (2) the symptoms were apparently due to an abscess in the lesser peritoneal sac, (3) the mass present simulated an enlarged spleen and (4) the gastric lesion produced a niche roentgenologically which, according to Alexander Moore, is very unusual with leiomyoma.

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REFERRED PAIN IN A TRAUMATIC INTESTINAL RUPTURE

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During the past ten years, the incidence of jejunal ulcer following gastro-enterostomy has been studied intensively. Von Haberer in Europe and Lewisohn in America have been led by its alleged frequence to advocate extensive gastric resections for duodenal ulcer. This discussion has incidentally diffused much information about the symptoms of jejunal ulcer. It causes pain regularly below and to the left of the umbilicus. In view of this well established clinical observation, the following case is of interest:

E. L. N., a boy, aged 6 years, was brought, Sept. 3, 1930, to the Cook Memorial Hospital. He had been knocked down and run over by a light automobile. He complained at once and continuously of pain in his stomach. Physical examination showed extensive abrasions and contusions. Lesions were scattered over the arms and legs, and there was a severe bruise about the right eye with a subconjunctival hemorrhage. There was no bleeding from the ears or mouth. The boy was apparently perfectly clear mentally. The lungs were clear and the heart sounds were normal. The pulse was 120, but of good quality. His color was good and his skin dry. The temperature was 100 F. There was no evidence of any fracture or dislocation. The boy was extremely restless, turning from his back to his abdomen and back again. He repeatedly placed his finger just below and to the outer side of the navel and said that he hurt only there. There was a band of contusion extending from the lower ribs on the left side downward and obliquely across the abdomen. The abdomen showed little rigidity. The liver dulness was not obliterated. There was no shifting dulness. Nothing was made out by rectal examination. The urine was clear, except for an occasional red cell and a few white cells. The red blood cells numbered 4,600,000; the hemoglobin was 75 per cent; the white blood cells numbered 19,800, with 68 per cent polymorphonuclears. Four hours later the hemoglobin was still 75 per cent. A flat plate of the abdomen showed no air above the liver.

The boy was in only moderate shock and, though he could easily have suffered a severe intra-abdominal injury, the only complaint or physical sign that he had was a sharply localized

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pain just to the left and below the umbilicus. This is so frequent in jejunal ulcers that an upper intestinal injury came to mind. He was given no opiates and nothing by mouth and was examined hourly. He continued to point to the same spot as the site of pain. Four hours after the injury he vomited. Six hours after the accident his temperature was 102 and his pulse 130, he was mildly delirious and showed a slight abdominal rigidity. It was decided to open the abdomen. With procaine hydrochloride used locally, a small incision was made just to the left of the navel. A little thin clear yellowish fluid welled out. It was odorless, and no fat necroses or peritoneal irritation were made out. The patient was given ether and the incision lengthened. Considerable quantities of fluid issued from the wound, evidently containing some bile. The liver felt normal; the stomach, as far as could be seen, was not injured. As I reached toward the spleen, a gush of fluid come out and a few gas bubbles rose through it. The spleen felt normal. When the transverse colon was lifted up, the source of the trouble was obvious. At the beginning of the jejunum and extending up into the fossa of Treitz was a slightly oblique rent through the intestine, 1 inch long. The adjacent mesocolon and intestine for 2 inches about the tear were covered with thick fibrin. The hole was closed with two layers of chromic catgut. A smear of the free fluid showed no organisms. The abdomen was closed without drainage. The child's condition seemed bad at the close of the operation. The next morning he was greatly improved and had a rapid convalescence, marred only by a low grade infection in the abdominal fat.

It is interesting that a tear in the jejunum in the segment subject to ulceration following gastro-enterostomy should have so accurately and conspicuously reproduced the referred pain of jejunal ulcer.

1212 North Street.

ACUTE TOXIC NEPHRITIS COMPLICATING ACUTE OBSTRUCTION OF THE SMALL INTESTINE

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CHICAGO

S. B., a Negro, aged 24, was admitted, April 14, 1930, to the surgical services of the Cook County Hospital, Chicago, because of a swelling in the right inguinal region, vomiting, and severe abdominal cramps for the past twenty-four hours.

The patient stated that he had had a right inguinal hernia for the past two years. The day before, about 2 p. m., he suddenly developed a sharp, colicky pain in the right inguinal region. An hour later he noticed a round, hard and tender mass in the same area. The pain was followed soon by nausea and vomiting, the vomitus consisting of food material and mucus. About 3 o'clock the pain had spread over the entire abdomen and was especially marked around the umbilicus.

He vomited again at 5 and at 6 a considerable amount of grayish material. He tried to go to sleep but was awakened again by the pain. He took a cathartic but had no results. He suffered pain all night and could not sleep. At 8 a. m. he vomited again, the vomitus this time consisted of thin, brownish, foul smelling material. The pain in the inguinal region was getting worse. He called a physician, who advised him to go to the hospital. His past history was negative except for yellow fever at 12 and mumps three years before admission. The family history was negative.

The patient was well developed and well nourished. His temperature was 97 F.; respiration, 22; pulse, 88; blood pressure, 160 systolic and 106 diastolic.

Physical observations were essentially negative, except for the right inguinal region. Here a hard, round and tender mass about the size of a large walnut was noticed. This mass increased in size and transmitted a definite impulse to the hand on coughing. The mass was reduced after a little manipulation. This resulted in relief from pain.

Urinalysis revealed a dark amber fluid, with a specific gravity of 1.036; albumin, 4 plus; sugar and acetone, 0. Many granular and hyaline casts were found in an uncentrifugated specimen.

On account of the hypertension, vomiting, and the condition of the urine, an acute nephritis with impending uremia was considered, and the patient was transferred the same day to our medical service for observation.

April 15 we saw the patient and found him quite comfortable, not acutely ill. The vomiting did not recur. The pain in the right inguinal region and abdomen had disappeared since the reduction of the hernia. The blood pressure had come down to $\frac{120}{78}$. The urine still showed albumin 2 plus with many hyaline and granular casts in a centrifugated specimen.

The further progress of the case was uneventful. The albumin and casts diminished from day to day, so that on April 19 the urine was free from albumin and casts. The blood pressure remained normal. The blood indican test was negative. The report of the chemical examination of the blood having been misplaced, we cannot give exact figures.

A Mosenthal test, April 19, gave: concentration, 1.006-1.018n and 1680 cc. secreted from 10 a. m. to 8 p. m.

A phenolsulphonphthalein test, April 22, gave: first hour, 15; second hour, 20; total, 35.

The patient was transferred back to the surgery, where a herniotomy was performed, April 28. He was discharged, May 7, 1930. His renal function throughout convalescence was normal.

COMMENT

For some time it was known that in certain cases of acute obstruction of the small intestine there is often present severe renal injury which may be the cause of death. McQuarrie and Whipple,[1] in experimental study of intestinal obstruction in dogs, proved conclusively that the renal function was definitely impaired. They found a decreased elimination of phenolsulphonphthalein and chlorides in the urine with increased concentration of urea and nonprotein nitrogen and pointed out the possible clinical importance of these observations.

Tucker [2] has called attention to the renal factor in the toxemia and death following gastro-enterostomy. He believed uremia to be the probable cause of death. In four of his cases, necropsy revealed the grafting of an acute process on a previously existing chronic nephritis.

Tileston and Comfort [3] have shown a marked increase in total nonprotein nitrogen and urea in the blood in cases of acute intestinal obstruction.

Brown, Eusterman, Hartman and Rowntree [4] have shown that severe renal injury exists in many cases of duodenal and pyloric obstruction. This toxic injury to the kidneys is of grave consequence and is characterized by: albuminuria and cylindruria; marked functional impairment of the kidneys associated with marked increase of total nonprotein nitrogen, of creatinine and urea in the blood, and a definite decrease of phenolsulphonphthalein excretion; a clinical syndrome due in part, at least, to renal insufficiency, and a well defined pathologic picture of toxic nephritis.

We can interpret our case, then, as follows:

A loop of the small intestine was caught in the inguinal ring, producing a strangulated hernia and intestinal obstruction. Absorption of toxins from the obstructed intestine resulted in an acute toxic nephritis as manifested by the sudden increase in blood pressure, albuminuria and casts. Reduction of the hernia restored the function of the small intestine. The acute symptoms such as hypertension and vomiting subsided, the urinary symptoms subsiding more slowly, but eventually clearing up. The phenolsulphonphthalein output remained below normal a longer period.

This case is interesting because of the rapid development of toxic nephritis in a case of acute intestinal obstruction of less than twenty-four hours' duration, and just as rapid abatement of symptoms with the disappearance of the obstruction. The danger of kidney damage must be considered in hernias in which loops of the small intestine are involved.

185 North Wabash Avenue.

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A CONFIRMATORY PHYSICAL SIGN IN ASCITES

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In cases of ascites, when one side of the abdomen is tapped with the finger and the other side is auscultated, two sounds similar in timing to the normal heart sounds have been observed. The first sound is caused by the sound wave being transmitted through the fluid; the second is the result of the fluid wave crossing the abdomen and striking against the auscultated side. These two sounds are heard more clearly in thin, tense abdomens as opposed to flat, soft, flabby ones and are best heard at the level of the fluid and intestine, as demonstrated by an experiment with a closed rubber bag partially filled with air and water. There seems to be no reference to this auscultatory sign in cases of ascites in any of the standard textbooks on physical diagnosis.

It is stated by several of the German writers that, when fluid is injected into the abdomen of an adult cadaver, 1,500 cc. is necessary before any of the usual physical signs of ascites appear, such as distended abdomen, shifting dulness, and the fluid wave. These signs and the auscultatory sign were present in eighteen cases of ascites examined and confirmed by abdominal aspiration, operation, or autopsy. The auscultatory sign could not be demonstrated in any cases in which these signs were absent, nor was it noted in abdomens markedly distended with gas. However, it was clearly heard in one case of a large ovarian cyst which was later removed at operation.

This observation is offered here only as an additional confirmatory sign in the detection and diagnosis of ascites.

St. Luke's Hospital.

TRAUMATIC ULNAR NEURITIS DUE TO STRAPPING OF THE ELBOW AND THE FOREARM TO THE OPERATING TABLE

E. S. GURDJIAN, M.D., DETROIT

The ulnar nerve traversing the epicondylar groove of the humerus in a subcutaneous position is apt to be injured through changes either within itself or in the surrounding tissues. Scar tissue formation in the groove caused by bruises and small hemorrhages may compress this structure and thus irritate it. When one considers the fact that the ulnar nerve with each flexion-extension movement at the elbow moves half an inch or more, one realizes the ease with which changes in the groove through which it traverses may irritate and alter its functions. In the next few paragraphs I shall describe the case of a young man, aged 24, who was taken to the operating room for herniorrhaphy. The upper extremities were strapped to the table in the usual manner. Soon after the reaction from the anesthetic he noticed a peculiar feeling of numbness in the little and ring fingers of the right hand.

I saw the patient ten months after the operation. The feeling of numbness in the ulnar distribution of the hand had persisted along with progressive weakening of the grip to the extent that he was unable to use the hand to advantage in his vocation of plumbing.

Examination showed definite hypesthesia in the ulnar distribution of the hand, inability to approximate the little finger and the thumb, and marked atrophy of the adductor pollicis and the interosseous muscles. The rest of the neurologic examination was essentially irrelevant.

A diagnosis of traumatic ulnar neuritis was made, and the patient was advised to have the operation of ulnar transposition and neurolysis, if necessary. This was performed. The ulnar nerve was taken out of the epicondylar groove and transposed to the anterior aspect of the elbow. Adhesions were noted between the nerve and the surrounding tissues. Neurolysis was not found necessary. A few days after the operation the numbness in the ulnar distribution disappeared. Three months later the adductor pollicis was about the same size as its fellow on the opposite side. The grip was practically normal.

COMMENT

This case illustrates an ulnar neuritis caused by strapping the elbow and the forearm to the operating table. It is possible that during the administration of the anesthetic and the period of excitement he bruised the inner aspect of the right elbow and the walls of the epicondylar groove, followed by scar tissue formation. With the narrowing of the ulnar canal the nerve became chronically irritated through compression and adhesions. This is substantiated by the operative observations already described and by the fact that the patient recovered complete function soon after the nerve was transposed from its normal bed.

It is not within the limits of this case report to discuss at length the causes, clinical manifestations and operative treatment of traumatic ulnar neuritis. Several excellent papers have been written on the subject.[1] Suffice it to say that it is important to recognize such lesions as early as possible and after a period of waiting if the function does not return to perform the operation of ulnar transposition and neurolysis, if necessary.

840 David Whitney Building.

Special Article

THE INDISPENSABLE USES OF NARCOTICS

IN THE PRACTICE OF MEDICINE*

FREDERICK TICE, M.D.

CHICAGO

As a preliminary to the therapeutic employment of narcotics, it is advisable or necessary to consider what is understood by the term narcotics and how they produce their beneficial effect. There is no generally accepted definition or classification of the narcotic drugs, except, perhaps, that they are included in a group producing varying effects on the nervous system. In this comparatively large group are found not only narcotics but also hypnotics, soporifics, anesthetics, analgesics, antispasmodics and several other subgroups, more or less closely related in several respects but with some distinguishing characteristic.

The physiologic effect of opium and its derivatives depends in part on the particular preparation that is employed, as well as on the amount of the drug. In general terms it may be said that small amounts produce an exciting effect while in larger doses there is an analgesic action and in sufficient dosage hypnosis, coma and even paralysis, particularly of the respiratory center. To these effects may be attributed the extensive therapeutic employment of opium and its derivatives. The analgesic property is so decisive as to constitute its chief characteristic.

For the relief of pain, morphine has no rival, and it is this distinguishing property that makes it indispensable in the practice of medicine. The decreased perception to pain is due to the almost elective effect on the pain perception centers of the cerebrum. Apparently these centers are widely distributed, perhaps in many or all the central areas. With this decreased or sus-

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* These articles are prepared under a plan of cooperation between the American Medical Association, the Committee on Drug Addiction of the Division of Medical Sciences of the National Research Council, and the Division of Mental Hygiene of the United States Public Health Service. Their object is to reduce the legitimate use of addiction drugs to a minimum by replacement, wherever possible, with other remedies that will accomplish the desired result. The physicians of the United States are the essential group in any such attempt and it is hoped that these articles will be useful to them in their practice. The funds for this work have been donated to the National Research Council by the Bureau of Social Hygiene, Inc.

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pended function of the cerebral perception of pain, the function of the centers in the midbrain is abolished, while the reflex irritability of the cord remains practically unaffected. This analgesic effect is evident in comparatively small doses, much larger amounts being necessary to produce hypnosis.

The employment of opium for its hypnotic effect alone is open to question and is liable to severe criticism or even censure. With the almost innumerable newer hypnotics now available, there is little or no justification for the use of opium with its accompanying danger of dependence and habit formation. However, it must be said that the claims of some of the manufacturing chemists that particular preparations are proper substitutes for opium are grossly exaggerated and not justified by actual practice. This holds true particularly when relief of pain is desired, but occasionally after a faithful attempt to induce sleep with several or many of the usual hypnotics, recourse to some one of the opium derivatives becomes necessary.

With these preliminary considerations one may consider the various diseases in which the use of opium is indispensable. This is a most difficult task, as it is associated with the question of individual opinion and experience. That opium is indicated in certain diseases, and is contraindicated in others, nearly all will admit; but as to its specific use there are many physicians whose opinions differ and the question remains in doubt.

It is safe to say that all will agree as to the indispensability of morphine in the hopeless cases of carcinoma, regardless of the primary site. In cases of inoperable or extensive carcinoma of the uterus, prostate, bowel, tongue, stomach or breast, with or without generalized metastasis, morphine is a gift of the gods and its judicious use in relieving pain constitutes one of the greatest services the physician can render. Not only is the patient relieved of pain but the euphoria that results is a blessing, and death, which otherwise might be almost intolerable, is made easy and comfortable.

In another group of diseases, accompanied by pain and designated by colic, morphine is the drug of choice. In this group may be included the cases with biliary, renal or lead colic. Some one of the general anesthetics, as chloroform or ether, may give the desired relief but not without the necessity of maintaining a more or less complete anesthesia to obtain muscular relaxation, with the probability of a return of the pain as soon as the drug is discontinued. Accompanying renal, hepatic, pulmonary or cardiac pathologic conditions may constitute a contraindication to the use of either of the mentioned anesthetics. Except in a few cases the use of morphine is considered only a palliative measure, as renal and biliary colic are essentially surgical, while the relief in lead colic will be required only for a comparatively short time.

The further discussion of the subject may best be accomplished by considering the various diseases according to the anatomic systems. Certain cardiovascular diseases, particularly those accompanied by pain, should be mentioned. Acute pericarditis, if the pain is severe, may fail to respond to any therapeutic effort short of the administration of morphine hypodermically, to be repeated as required. Perhaps the rheumatic type, in the acute plastic stage, is the form most frequently accompanied by severe pain, although any type may belong in the group.

Difference of opinion may exist as to the necessity of employing morphine in the arteriospasmodic type of angina pectoris. While it is true that most of the cases will respond to some of the vasomotor drugs, there are instances requiring one or more doses of morphine. In the coronary occlusion type of angina, whether embolic, obliterative or thrombotic, morphine becomes imperative. In this type the anginoid attacks are prone to be severe and protracted, without much, if any, expectation of relief from the vasomotor dilators.

In the pleuropulmonary group, some of the diseases and symptoms will require consideration. Although acute plastic pleurisy, either primary or secondary to pulmonary disease, with its excruciating pain and dyspnea, responds to some extent to immobilization by adhesive straps and physical therapy, too often the desired relief is obtained only by single or repeated doses of morphine.

Acute spontaneous pneumothorax, accompanied by pain and dyspnea, requires temporary relief by morphine until other therapeutic measures can be employed.

In pulmonary diseases, certain symptoms may predominate and endanger life. Pulmonary hemorrhage from any cause, particularly the massive form, accompanied by fear and anxiety, may be much relieved or benefited by a preliminary or repeated injection of morphine, this to be followed by the usual recognized therapeutic efforts, depending on the underlying pathologic condition. The dyspnea of far advanced pulmonary tuberculosis may well be classed with the hopeless cases of carcinoma, in which some relief and comfort may be had during the final days or hours. Much relief and comfort may be had in the dyspnea of primary or secondary cancer of the lung. The same is true in some cases of aneurysm compressing the trachea or a bronchus.

In the gastro-intestinal group, gastric and rectal carcinoma of the inoperable and hopeless type have already been considered. The pain in gastric and duodenal ulcers, when present, will usually respond to ulcer management and does not require special analgesics. In the event of perforation, the treatment is surgical, but as a palliative measure a single or repeated hypodermic of morphine may be advantageous.

The bowel diseases, as acute enterocolitis, spastic and ulcerative colitis, diverticulitis, appendicitis and the various forms of dysentery, require their own individual form of therapy and rarely constitute a cause for special analgesics or opiates. Usually the cramps, pains and irregular bowel action in spastic colitis, on a bowel management with tincture of belladonna, will be relieved, but occasionally the cramps or a profuse diarrhea can be controlled only by doses of an opiate, preferably camphorated tincture of opium. If the diarrhea is the predominating complaint, powdered opium may give the best results as the powder is more slowly absorbed in the intestinal tract. With the increased knowledge of the different types of dysentery, there has necessarily been an improvement in the therapy. Many of the older drugs have been discarded. As in spastic colitis, when diarrhea is particularly pronounced and uncontrollable by other means, powdered opium may be of service. Rectal tenesmus, regardless of the cause, can be best controlled or relieved by rectal suppositories containing powdered opium or morphine.

Of the remaining mentioned diseases, appendicitis is surgical and often ulcerative colitis and diverticulitis also are best treated surgically. Rarely, if ever, is an opiate required or justified.

Some mention should be made of typhoid and the former practice of prescribing morphine or opium in the treatment of complicating bowel hemorrhages. As the bleeding is usually due to the ulceration of the bowel, there is always the question of accompanying or developing perforation. When morphine or opium is prescribed, the symptoms and signs may be so modified as to make the differential determination more difficult or even impossible.

While the cerebrospinal group includes a considerable number of diseases, only a small minority of them can justly claim the indispensable therapeutic use of opium or its derivatives. It is in the symptomatic treatment of the various psychoses, and in neuroses, psychoneuroses, hysteria and insomnia, that the newer hypnotics are of such indispensable service. Even in the acute manias and in delirium tremens it is only after the bromides and chloral hydrate, paraldehyde and the newer hypnotics have failed that an opiate is permissible. It should be emphasized again that the employment of opium, or its derivatives, for their hypnotic effect alone is open to question.

As to the spinal diseases, special mention should be made of tabes dorsalis with tabetic crises and lightning pains. The use of morphine to relieve these conditions should be the last resort, as dependence and morphinism are easily produced. Epidural injections in combination with the usual syphilitic therapy have produced most gratifying results and it is only in rare instances that morphine is required.

Peripheral neuritis, local or multiple, is usually secondary to some primary pathologic condition. The neuritis may be of the alcoholic or arsenical type, perhaps due to a focal infection or a compression, as in spinal caries or a cervical rib. In each individual case, the therapeutic efforts should be concentrated in an effort to relieve the primary cause.

The opium or codeine treatment of diabetes mellitus has no longer been in vogue since the advent of insulin, but, not infrequently, there is an associated diabetic neuritis. When the pains are severe and do not subside on diabetic therapy, occasional doses preferably of codeine or even of morphine may be required.

Coca leaves or the fluidextract have no justifiable therapeutic claims. The chief alkaloid, cocaine, owes its popularity to the marked local anesthetic effect produced when applied to mucous membranes or injected hypodermically. This anesthetic effect is due to the paralysis of the terminal sensory nerves or the vasomotor constriction which interferes with the nerve function.

With the advent of the newer local anesthetics, cocaine has lost much of its importance. .

Formerly nausea and vomiting, with or without gastralgia, occurring in acute gastric conditions were indications for the use of cocaine, but now they are readily relieved by one of the nontoxic local anesthetics. The vomiting of pregnancy no longer is a justifiable cause for the use of cocaine, as the condition is relieved by the newer local anesthetics, dextrose intravenously or ovarian endocrines.

At one time cocaine, applied locally or by spraying, was a favorite means of giving relief in hay-fever and asthma, through its vasomotor effect on the mucous membranes. The same or better results may be had with ephedrine or epinephrine, completely displacing cocaine and the danger of habit formation.

25 East Washington Street.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

NUPERCAINE-CIBA. — α-butyloxycinchoninic acid, γ-diethylethylenediamide hydrochloride. — 2-butyloxyquinoline-carboxylic acid-4-diethylethylenediamide hydrochloride. $C_9H_5N.OC_4H_9(2).CONH(CH_2)_2N(C_2H_5)_2HCl(4)$.—The hydrochloride of the base α-butyloxycinchoninic acid γ-diethylethylenediamide obtained by chlorination of α-chlor-cinchoninic acid chloride and conversion of the latter with asymmetric diethylethylenediamine into α-chlor-cinchoninic acid diethylethylenediamine and subsequent heating with sodium butylate. Nupercaine was first introduced as percaine.

Actions and Uses.—Nupercaine is a local anesthetic, acting like cocaine when applied to mucous surfaces and like procaine or cocaine when injected, the action being relatively prolonged. Nupercaine is about five times as toxic as cocaine when it is injected intravenously into animals, and its anesthetic activity is correspondingly greater than that of cocaine when it is applied to a mucous surface; it is many times more active than procaine hydrochloride when it is injected subcutaneously. It is reported to have caused necrosis of tissue in one case and a condition resembling gangrene with recovery in another. Death has been reported after the subcutaneous injection of 135 cc. of a solution of 1 in 1,000. Weak solutions (1 in 2,000) cause slight temporary vascular dilatation (avoided by the addition of epinephrine hydrochloride), followed by constriction. The usual precautions should be observed when it is injected into the spinal canal or into the urethra.

Dosage.—For infiltration anesthesia solutions of from 1 in 2,000 to 1 in 1,000, with the addition of 0.1 cc. of epinephrine hydrochloride solution to 100 cc. of the solution. Not more than 100 cc. of 1 in 1,000 solution should be injected. For spinal anesthesia, a total of from 7.5 to 10 mg. (⅛ to ⅙ grain) in 1 in 200 solution; for sacral anesthesia, 25 to 35 cc. (about 1 fluidounce) of 1 in 1,000 solution or a correspondingly smaller volume of 1 in 500 solution. The details of dosage should be learned with reference to various modifications for different applications. Aqueous solutions of nupercaine should be prepared with distilled water, as the salts present in tap water of many localities may precipitate the free base, butyloxycinchoninic acid diethylethylenediamide. Alkali-free glass should be used in the preparation of its solutions.

Manufactured by the Society of Chemical Industry in Basle, Basle, Switzerland (Ciba Company, Inc., New York, distributor). U. S. patent applied for. U. S. trademark 266,366.

Ampules Buffered Solution of Nupercaine-Ciba 2 cc., 1: 200.
Ampules Solution of Nupercaine-Ciba 5 cc., 1: 1,000.
Solution of Nupercaine-Ciba, 2%.
Tablets Nupercaine-Ciba, 50 mg.

Nupercaine occurs as fine, white, crystalline, odorless powder; hygroscopic; very soluble in water, about 2 in 1, freely soluble in alcohol, soluble in acetone and chloroform, slightly soluble in benzene, ethyl acetate and toluene on warming, but with difficulty in the cold. Its aqueous solution, about 1 in 20, is faintly alkaline to litmus, producing a definite anesthesia on the tongue. Nupercaine "melts" at 90 to 98 C.

Transfer about 0.5 Gm. of nupercaine to a suitable Squibb separatory funnel, add 25 cc. of water, followed by the addition of 2 cc. normal sodium hydroxide solution and extract with three successive portions of purified petroleum benzin, using 25 cc., 20 cc. and 10 cc., respectively; evaporate the combined petroleum benzin extractions to dryness: the crystals melt at not less than 64 C. Nupercaine-base fluoresces with the more common oxygen containing acids. Dissolve about 0.5 Gm. of nupercaine in 50 cc. of water; add 0.2 Gm. of potassium perchlorate previously dissolved in 25 cc. of water and allow to stand several hours: the crystals of nupercaine perchlorate crystallized from water melt at 130 to 132 C. Dissolve about 0.5 Gm. of nupercaine in 50 cc. of water; separate portions of 10 cc. each yield a white precipitate on the addition of 1 cc. of nitric acid and 2 cc. of silver nitrate which after decantation of the supernatant is soluble in an excess of ammonia water; no turbidity with 1 cc. of diluted hydrochloric acid and 1 cc. of barium chloride solution (*sulphate*); no coloration or precipitation on saturation with hydrogen sulphide (*salts of heavy metals*).

Dry about 0.5 Gm. of nupercaine, accurately weighed, over sulphuric acid in a desiccator for forty-eight hours: the loss does not exceed 2.5 per cent. Incinerate about 0.5 Gm., accurately weighed: the residue is not more than 0.1 per cent. Transfer about 0.5 Gm. of nupercaine to a 400 cc. beaker, add 75 cc. of water, followed by the addition of 25 cc. of tenth-normal silver nitrate solution and 10 cc. of nitric acid, subsequently boil, with continuous stirring and allow to cool in a dark place. Collect the precipitate of silver chloride on a Gooch crucible, wash with nitric acid and water, followed by alcohol and ether; finally

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dry to constant weight at 105 C.; the amount of hydrogen chloride calculated from the silver chloride found corresponds to not less than 9.5 per cent nor more than 9.7 per cent, calculated to the dried substance. Transfer about 0.3 Gm. of nupercaine-Ciba, accurately weighed, to a suitable Squibb separatory funnel, add 50 cc. of water, followed by the addition of 2 cc. of normal sodium hydroxide solution, extract with six successive portions of chloroform, using 50 cc., 25 cc., 20 cc., 15 cc., 10 cc. and 10 cc., respectively, wash the combined chloroformic solution with 15 cc. of water and evaporate to a thick oil in a stream of warm air; expose over sulphuric acid in a partially exhausted desiccator; dissolve the oily residue in about 10 cc. of previously neutralized alcohol; warm slightly; add 10 cc. of tenth-normal hydrochloric acid solution, followed by the addition of an equal volume of water; determine the excess of acid by titration with fiftieth-normal sodium hydroxide solution, using methyl red as an indicator; the amount of tenth-normal hydrochloric acid solution consumed corresponds to not less than 88.5 per cent nor more than 90.5 per cent butyloxycinchoninic acid diethylethylenediamide, calculated to the dried substance.

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

W. A. PUCKNER, Secretary.

DI-CITURIN NOT ACCEPTABLE FOR N. N. R.

Di-Citurin is stated by the Chemico-Biologic Laboratories to be "Potassium Acetyl Citrate" and in the advertising it is asserted that the product is "a basic compound, not a mixture." In the information submitted to the Council, however, the firm states that "the substance is acetylated Citrate of Potassium with Magnesium Salicylate present as a by-product." Furthermore, the A. M. A. Chemical Laboratory reports that a microscopic examination of a specimen of the product revealed two distinct and separate sets of crystals, one resembling potassium acetate closely, the other resembling potassium citrate. The conclusions of the Laboratory were submitted to the Chemico-Biologic Laboratories with a request for evidence that Di-Citurin is a definite substance and not a mixture. This evidence was not supplied, but the firm again emphasized the presence of relatively large amounts of magnesium salicylate as an impurity. A second specimen was submitted which apparently was quite impure and had a strong odor of acetic acid. The Laboratory concludes that the product does not have the composition claimed.

In the advertising Di-Citurin is described as: "A therapeutic agent that controls arthritis and rheumatic affections by physiologic rather than chemical action and without irritant or depressant effect." It is stated that "the pharmacological actions of Di-Citurin that fulfil, in a notable degree, the requirements in the treatment of these affections are: An increase in the leucocytes, which raises body resistance to infection. A distinctly individual action upon the filtration membranes of the kidney, markedly increasing their permeability to the passage of various excretory substances of the blood . . ." but gives no hint of the similar effects to be obtained from alkali acetates and citrates. This invites the uncritical use of the product as does also the name, which the proprietors state has been coined from "Di" for diuretic, "cit" for citrate and "urin" for urine.

The evidence that is presented by the firm's advertising is based on a discussion of chlorides, no account being taken of other acid-base factors. Sweeping claims are made for the value of the drug in the treatment of arthritis as well as for renal elimination; but no evidence is offered that the action of Di-Citurin differs from that of a mixture of potassium acetate and potassium citrate or from the use of either drug alone. In the cases in which there is stated to have been a reduction of blood pressure, no statement is made as to bed rest nor are simultaneous control cases given.

The advertising is largely made up of partly true but essentially misleading statements; in effect it constitutes an attempt to use simple alkaline diuretics of unquestioned but extremely limited value as the basis for grotesque claims which cannot deceive any but the most ignorant. It would require many pages to discuss the advertising adequately, for such a discussion must be strictly governed by the weight of available evidence, whereas the advertising is not thus limited, frequently containing statements for which there is no evidence either for or against.

Di-Citurin is unacceptable for New and Nonofficial Remedies because its composition is not correctly declared; because the therapeutic claims advanced are exaggerated and unwarranted; because its therapeutically suggestive name will lead to uncritical use, and because no evidence is offered that the product possesses any advantages over a mixture of its components, over a simple mixture of alkali acetate and citrate, or over alkali acetate or alkali citrate alone.

COMMITTEE ON FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COMMITTEE ON FOODS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

VELVEETA

A Delicious Cheese Food. Kraft Process American Cheese with added milk sugar, milk minerals and water.

Manufacturer.—Kraft-Phenix Cheese Corporation, Chicago.

Description.—A cheddar cheese admixed with cream (or butter and skim milk powder), milk-whey powder and salt, packed in tin-foil lined one-half pound packages.

Manufacture.—Milk from tuberculin tested cattle is pasteurized, brought to a temperature of 37 C., and curdled by the action of added rennet. The whey is drained from the curd. The curds are matted, pressed into regular cheese molds and aged under controlled temperature and humidity conditions. The typical flavor and consistency of cheddar cheese develops during the aging process.

The drained whey is spray-dried by being forced under a pressure of 1,800 pounds per square inch through small apertures into a hot air drying chamber (approximately 300 F.). The dry whey falls as a powder into a hopper in the bottom of the chamber and is released into barrels.

Cheddar cheese selected as to quality, consistency and flavor is finely ground and then mixed with cream (or butter and skim milk powder), whey powder and salt. The mixture is pasteurized at 145 F. for thirty minutes by being forced through a specially constructed hot water jacketed pasteurizer, is packed in one-half pound tin-foil lined packages by automatic machinery and is immediately chilled.

About 30 per cent of the whey separated from the original milk used in making the cheddar cheese is returned to the cheddar cheese mix in the manufacture of Velveeta. Butter with skim milk (equivalent to composition of cream) is substituted for fresh cream when insufficient quantity of the latter is available.

Chemical Composition.—

(proximate analysis)	
Moisture	44.0%
Ash	6.0%
Fat (Babcock method)	25.5%
Protein (N × 6.38)	18.0%
Lactose (Bertrand method, Mathews Physiological Chemistry, page 952)	6.3%
Calcium (Ca)	0.53%
Phosphorus (P)	0.71%
(proximate analysis of milk-whey used)	
Moisture	0.7%
Ash	8.0%
Protein (N × 6.38)	12.0%
Fat (ether extract)	0.4%
Reducing sugars, calculated as lactose with water of crystallization	73.4%

Calories.—

3.27 per gram
92.9 per ounce
1,486. per pound

Vitamins.—Contains approximately 10 vitamin A units per gram; 75 mg. of Velveeta is equivalent to 10 mg. of butter in vitamin A potency.

The vitamin content may be considered as approximating that given for cheddar cheese in U. S. Department Circular 84 (1929), Vitamins in Food Materials:

A + + to + + +
B (absent or not sufficient data)
C (absent or not sufficient data)

Claims of Manufacturer.—Velveeta, a new type of cheese food richer in milk minerals and lactose than the usual cheeses not containing the milk-whey, is recommended to supplement the milk intake of growing children. It spreads well on bread and is well adapted for sandwiches and salads.

Velveeta is a good source of vitamin A.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MARCH 21, 1931

MENSTRUATION AND OVULATION

Most physicians are accustomed to assume that menstruation is in some way connected with ovulation in women, or, more specifically, with the fate of a liberated ovum. If the ovum is fertilized and implanted, menstrual changes are averted. Corner [1] has pointed out that the heart of the difficulty in understanding some of these fundamental features of the reproductive cycle in man obviously lies in ignorance of the time relation of ovulation and implantation with respect to menstruation. It is not known, by any direct observation, he states, when the primate ovum is discharged; the unfertilized ovum has never been observed after leaving the ovary, nor has the fertilized egg been seen early enough to give any information with regard to the earliest stages of implantation; i. e., during the first two weeks. In the lower forms the phenomenon of estrus with its sharply defined period serves as a clue to the moment of ovulation. Menstruation is by no means identical, as some have believed, with the estrus of animals. To many students it has represented "merely a violent demolition of the premenstrual uterine edifice, some days after the expected tenant fails to arrive. The only normal outcome of an ovulation is pregnancy, and the hemorrhage is viewed as a pathological result of failure in this respect."

A group of investigators [2] at the Johns Hopkins Medical School now venture the assertion that there is something radically wrong with the prevailing or "modern" gynecologic theory of the menstrual process, which presupposes ovulation and makes the degeneration of the corpus luteum responsible for the uterine bleeding. They have postulated that the cause of menstruation is an active one and have searched outside the ovaries for the source of the stimulus, probably hormonal in nature. Working with female monkeys they have found, as others had observed, that injection of the Allen-Doisy hormone preparation causes bleeding in the animals, whether normal or castrated. The effect is, however, not a direct one, for hypophysectomy abolishes the effect. But bleeding occurs in hypophysectomized as well as normal animals by injection of anterior lobe extracts or by implants of the fresh gland. This is interpreted as a direct effect. Furthermore, bleeding from the uterine mucosa is a phenomenon independent of hyperplasia, swelling, or even congestion of the tissues. The Baltimore investigators point out that it does not follow, of course, that bleeding is normally an independent phenomenon. They are fully aware of the interactions of all parts of the body, the endocrines in particular. Thus, normally in women the follicle stimulating and the luteinizing hormones come into play, ovulation occurs, the anterior lobe is stimulated, and bleeding occurs from a "prepared" or pregravid endometrium of the Hitschmann and Adler type. But, they add, the stimuli coming from the ovary (or other link in the endocrine chain) may be insufficient to liberate the first two but quite adequate to liberate the hormone causing bleeding. In the absence of all these hormones—amenorrhea.

The possible absence of ovulation during long periods in which uterine bleeding may proceed seems now to be established. Hartman, Firor and Geiling allege that by their studies pointing to the action of the hypophyseal hormone a physiologic basis of uterine bleeding is for the first time demonstrated and the menstruation problem is lifted from the realm of theory and conjecture. It would seem, from the experiments on the monkey, to be possible to produce bleeding in a woman much more readily than stimulating a refractory ovary, and hence a dormant uterus, into action. The gynecologist interested in promoting menorrhea must determine what benefit the patient receives from a mere bleeding without the usual concomitant "estrous," not to mention pregravid, changes.

1. Corner, G. W.: Oestrus, Ovulation and Menstruation, Physiol. Rev. **3**: 457 (Oct.) 1923.
2. Hartman, C. G.; Firor, W. M., and Geiling, E. M. K.: The Anterior Lobe and Menstruation, Am. J. Physiol. **95**: 662 (Dec.) 1930.

WORK OF THE UNITED STATES PUBLIC HEALTH SERVICE

Many factors have exerted an influence in bringing about a change in the practice of medicine. Improved modes of transportation, professional specialization, increase in hospital facilities and codification of ethical standards have contributed to this change in no small measure. However, supporting the efforts of every physician in this country, and used by him either consciously or less directly, are the vast facilities in medical research and statistical information provided by the United States Public Health Service, an institution of such manifold activities and achievements that it is difficult to evaluate its influence on present-day medicine. As is true of most government bureaus, there has been a steady expansion in its activities from a modest beginning until, at the present time, according to a recent issue of *Public Health Reports*,[1] the service

1. Pub. Health Rep. **46**: 269 (Feb. 6) 1931.

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employs more than 5,000 persons with an annual budget of $11,000,000.

In 1798 Congress established the Marine Hospital Service, the forerunner of the present Public Health Service, which name was adopted in 1912. The original purpose of the service was to provide care for sick and disabled seamen not only in seaports but wherever in the country such service was needed. In order to support this new government venture, all sailors on American vessels engaged in foreign or coastwise trade were taxed 20 cents a month. The collector of customs gathered the fees, which, no doubt, accounts for the fact that the Public Health Service has always been in the Treasury Department. Gradually the activities of the Marine Hospital Service were expanded until it became a federal health service. Thus, in 1878 authority was granted to the service to prevent entry of disease into the country. In 1893 a further significant step was taken when power was granted by Congress to impose quarantines in order to prevent interstate spread of all infectious and contagious diseases. Since the Public Health Service by reason of its quarantine duties was the first agency to diagnose and to become familiar with such diseases as cholera, smallpox and yellow fever, it was natural that investigations into the etiology and the disseminating agents of such diseases should become a part of the interests of the service. Congress in 1901 authorized the construction of the Hygienic Laboratory in Washington, where investigations of infectious and contagious diseases could be carried on. Further expansion included studies into the conditions that influence the spread of diseases of man, and the culmination of the work of the service along investigative lines was reached in 1930, when the name was changed to the National Institute of Health and generous appropriations were made for additional buildings and equipment. This division of research of the service likewise carries on investigations in the so-called pure sciences which promise to have a bearing on the more practical aspects of the general problem. One of the duties of this division consists of supervision and control of biologic products. Viruses, vaccines, serums, antitoxins and similar substances to the value of $10,000,000 are supervised annually—work that requires inspections in many places in the United States and in a number of countries in Europe.

While the original purpose of the Public Health Service was to provide care for seamen, there are only twenty-five marine hospitals in this country. The policy has been to arrange for this care by contract with private hospitals. Some 300,000 persons apply annually for treatment in the marine hospitals and outpatient offices and there are from 3,000 to 4,000 sailors constantly in hospitals. More than 52,000 patients were given dental treatment during the last year. This division of the Public Health Service is charged also with the physical examination of candidates for license as pilots and other ships' officers, lighthouse keepers, able-bodied seamen and coast guard. Marine hospitals for more than ten years have replied to radio requests for medical advice from vessels at sea. Certain of the marine hospitals have become known for their work on special diseases, notably the one at Fort Stanton, New Mexico, where tuberculosis is the special interest, and the National Leper Home at Carville, La., where the work is sociological as well as medical in character.

The maintenance of quarantine is another of the duties of the Public Health Service. The prevention of free travel of persons or animals infected with a contagious disease is one of the oldest methods whereby society protects its health. The discovery of the mode of transmission of many of these diseases has helped to facilitate the efficacy of quarantine; on the other hand, increase in the extent as well as development of newer modes of travel has increased the difficulty of such control. The Division of Foreign and Insular Quarantine of the service is charged with the prevention of entrance of infectious and contagious diseases into the United States at ports of entry and also cooperates with the Immigrant Service of the Department of Labor in examining immigrants. In addition there is careful observation abroad, in conjunction with consular officers, in order that such diseases may be prevented from being transported to this country on vessels. Cholera, plague, yellow fever, smallpox and typhus fever are especially guarded against, and control measures, either applied to the person or directed against the transmitting agents, are effectively employed. The Division of Domestic Quarantine supervises the interstate quarantine, cooperates with state departments of health, controls the water supplies for drinking on interstate carriers, cooperates in maintaining efficient sanitation in national parks, and studies and suppresses epidemics arising within the country.

The accumulation, classification, interpretation and, in recent years, popularization of facts pertaining to public health is one of the functions of the Division of Sanitary Reports and Statistics. Through this work the larger aspect of national health—etiology, epidemiology and preventive medicine—are made available to the physician. The Division of Venereal Diseases has cooperated with state boards of health in preventing the spread of syphilis and gonorrhea by disseminating information through lectures and films, gathering reliable statistics on incidence and treatment, in maintaining public clinics and in determining the value of certain diagnostic measures. The Division of Mental Hygiene is interested, among other things, in the problem of drug addiction. While a small proportion of addicts are mentally normal, the larger part are abnormal in this respect and are considered by the service as problems in mental hygiene.

The present-day citizen of this country accepts much as a matter of course. His very existence in great

groups in large cities is possible because of agencies which he supports, to be sure, but of the nature of which he is usually unaware. Such an agency is the Public Health Service with its long and honorable record of activity and its extraordinary awareness of the state of health of the nation. In this institution the individual physician has effective support for his labors.

PHOSPHATASE IN BLOOD AND BODY TISSUES

At present, much attention is being directed to calcium in the diet. There are, of course, two main reasons for this emphasis on the part of students of nutrition: first, the usual American dietary has been shown to be less satisfactory in its content of this element than in most other aspects while, second, there is a relatively large demand for calcium in the body, especially at certain periods in the life cycle. The normal development of bones is conventionally associated with an adequate supply of lime. However, phosphorus is likewise fundamentally involved in skeletal growth, but, since it is more plentifully supplied in the ordinary dietary, it seems to have received somewhat less attention by investigators of the biochemistry and pathology of bone development. The fact that most rations provide a sufficient supply of phosphorus indicates the variety of chemical combinations, both organic and inorganic, in which this element is presented to the body. Considerable uncertainty has existed as to the device whereby the cells in calcifying cartilage and other tissue cells remove the phosphorus from the blood; evidence has accumulated that an enzyme, phosphatase, plays an important part in this reaction.

The principal action of phosphatase consists in decomposing acid-soluble esters of phosphoric acid to inorganic phosphate. The enzyme has been shown to attack hexose phosphate, glycerophosphate, glycophosphate and even the sodium salt of guanine nucleotide. It acts most rapidly at the unusually alkaline reaction p_H 8.9. It has been found in high concentrations in growing bone, kidney and intestinal mucosa, and in less amount in the liver and the central nervous system. In a recent study, Kay [1] has shown definitely that normal blood plasma contains a phosphatase, qualitatively like the enzyme in the tissues, but present in small amount. The human kidney contains 300 times more of this factor than the same weight of plasma. The phosphatase content of the blood was examined in a variety of disease conditions. There was found little change from the normal values in diabetes, various diseases of the kidneys, arthritis or hypoparathyroid conditions and in persons with neoplasms. In some cases with thyroid involvement, and in osteomyelitis, rickets, osteitis fibrosa, osteomalacia and osteitis deformans, the phosphatase was greatly increased, being twenty times greater than normal in some instances. Furthermore, the increase in enzyme concentration was, in general, parallel to the severity of the disease.

Taken together with certain observations on the phosphatase of normal tissues, these results with the plasma enzyme concentration in generalized bone disease indicate the possible normal behavior of these factors. It has been shown that phosphatase is not found in noncalcifying cartilage but that where calcification is taking place the enzyme is present; the more active the formation of bone, the greater the concentration of enzyme. Phosphatase occurs in embryonic bone growing in vitro. Apparently under normal conditions little of the enzyme from bones or other tissues passes out of the cells with the blood; but, when widespread breakdown of such tissues occurs, phosphatase accumulates in the blood in greater concentrations since it is only slowly excreted.

Kay has pointed out that, in contrast to the recognized changes in calcium and inorganic phosphate in the plasma in diseases of bones, far greater variations in phosphatase occur. Whether or not these newly discovered factors will facilitate diagnosis is not yet known. There is always the possibility of the practical application of enzymes to therapeutic requirements, an eventuality which, in the present connection, would be particularly fortunate.

1. Kay, H. D.: Plasma Phosphatase, J. Biol. Chem. **89**: 235, 249 (Nov.) 1930.

PHYLOGENETIC IMMUNOLOGIC RECAPITULATION?

Current theories of allergy and immunity are based on the assumption that normal human proteins are unchanged in specificity from the time the ovum is fertilized to its death. A different condition might have been developed if early experimenters had made the opposite assumption, a dynamic protein specificity.[1] Mass immunizations of adults to diphtheria, scarlet fever and poliomyelitis, for example, might have been pictured as a normal panimmunity; observed allergies as a result of arrested maturations, atypical differentiations or embryonic protein reversions.

Biochemical stasis is not assumed in other fields of pathology. An embryologic recapitulation of evolutionary history is postulated by many anatomists, with arrests, reversions and atypical recapitulations as the accepted explanation for numerous adult structural abnormalities. Wells and Corper [2] and Long [3] have apparently demonstrated embryologic recapitulation in human tissue enzymes. In all adult mammals except man and the higher anthropoids there is an adenine-splitting enzyme. Fifth to sixth month human embryos contain this lower mammalian enzyme, the enzyme, however, disappearing before the ninth month of intra-uterine life, at which time the human fetus

1. Manwaring, W. H.: J. Immunol. **19**: 155 (Aug.) 1930.
2. Wells, H. G., and Corper, H. J.: J. Biol. Chem. **6**: 469, 1909.
3. Long, A. R.: J. Biol Chem. **15**: 449, 1913.

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apparently passes into the higher human-anthropoid type of nitrogen catabolism. A similar enzymic recapitulation is suggested by the researches of Mendel and Mitchell.[4] They report that, in the embryonic domestic pig, nitrogen metabolism is effected without the aid of a uric acid-splitting enzyme, an intra-uterine purine metabolism somewhat resembling that of birds and reptiles. About two months after birth, uricase develops in domestic pigs, after which their purine metabolism is of the mammalian type.

The demonstration that human and animal protein specificities are not the same throughout the life of an individual is, therefore, if confirmed, one of the most significant basic contributions of the past two years. Picado[5] reports that rabbits immunized with human serums of the 7 to 10 year age group yield antibodies quantitatively diagnostic for that age group, and that human serums of the 60-70 years age group can be similarly diagnosed. In his hands, young rabbits, immunized with the blood or serum of old rabbits, give sharply defined isoprecipitins for the old-age proteins, negative reactions being obtained with youthful proteins. It is difficult to explain Picado's results without the assumption of a definite cycle of maturation of protein in each individual.

That such postulated maturations of protein possibly proceed along phylogenetic lines is suggested by recent studies of spontaneous mass immunizations. Toyoda and his co-workers[6] report that the adult Chinese of Manchuria show but half the percentage susceptibility to Dick toxin shown by the adult Japanese, and but one forty-fifth of the Japanese percentage morbidity to scarlet fever, the two races being equally susceptible at birth. Here are two races living under practically identical conditions, subject to the same environmental antigenicities. The observed difference is easily explained on the assumption that one is here dealing with a spontaneous protein maturation and that the Chinese are hereditarily endowed with more advanced protein maturation potential than the Japanese. This apparently fantastic suggestion is raised to the rank of a serious immunologic theory by recent clinical studies by Friedberger and his co-workers,[7] of the Hygienic Institute, Berlin. These investigators report the gradual appearance of apparently spontaneous maturation "antibodies" against certain noninfectious antigens in growing children, antigens, they believe, which never come in contact with human tissues. According to their interpretation, these "antibodies" are formed as a result of an hereditary general protein maturation law.

No immunologist, of course, would take the Friedberger maturation hypothesis as more than a challenge to basic research. But until the Friedberger theory is definitely ruled out, current antiallergic therapy cannot be said to rest on a firm theoretical basis, nor can epidemiologic deductions from observed mass immunizations be assumed to be more than of tentative validity.

4 Mendel, L. B., and Mitchell, P. H.: Am. J. Physiol. **20**: 97, 1907.
5. Picado, T. C.: Compt. rend. Soc. de biol. **102**: 631 (Nov. 29) 1929.
6. Toyoda, Taro; Moriwaki, Joji; and Futagi, Yasuo: J. Infect. Dis. **46**: 186 (March) 1930.
7. Friedberger, E.; Bock, G., and Fürstenheim, A.: Ztschr. f. Immunitätsforsch. **64**: 294 (numbers 3/4) 1929.

Current Comment

PATHOGENESIS OF OBSTRUCTIVE ATELECTASIS

The persistent study of experimental atelectasis is an indication of the importance of an understanding of the pathogenesis and mechanism of this condition to the thoracic surgeon. A situation in which the alveoli of the affected area are collapsed and contain no air is normal in the fetus, in which the aeration of the blood is effected by the maternal pulmonary apparatus; it may be brought about by compression resulting from an abnormal collection of pleural fluid, an intrathoracic tumor or massive collapse (pneumothorax); or it may result from obstruction in the bronchi. Recent studies of Coryllos and Birnbaum[1] indicate that the disappearance of the alveolar air in the atelectatic area can be accounted for by absorption into the blood. Obviously the atelectasis produced by obstruction lends itself most readily to experimental procedure. Using this device, Van Allen and Lindskog[2] have carried out an extensive study, which has explained some controverted points and raised new questions. They observed that atelectasis did not invariably follow a mechanically successful occlusion of the air passage involved; in fact, after being convinced that the alveolar air was exhausted, they frequently observed that the lobe of the lung contained air after an interval of several hours. The authors suggest that there is free intercommunication between the structural units of the lung and that air will readily pass from one lobule to another and hence to and from an area distal to the obstruction in the bronchus, provided the blocked bronchus ventilates only a portion of the lobe of the lung. When, however, all the air passages to the lobe are obstructed, atelectasis occurs. "The development of atelectasis following bronchial obstruction must depend primarily on the rate of two processes; i. e., loss of air and accession of air." Again, on theoretical grounds, the obstruction, usually produced by chemical or bacteriologic inflammation of the bronchi, should be dislodged or moved proximally by coughing. However, at times it appears that the plug is thus actually drawn farther into the peripheral portion of the alveoli. Van Allen and Lindskog point out that only when there is a residuum of air behind the plug is coughing effective in removing it. This air passes into the alveolus either past the plug during inspiration preceding the cough or through the septums from adjacent lobules. In making suggestions for the application of the facts observed, the authors advise caution lest factors in the pathogenesis of atelectasis, not yet recognized, be unwittingly promoted.

1. Coryllos, P. N., and Birnbaum, G. L.: Alveolar Gas Exchanges and Atelectasis, Arch. Surg. **21**: 1214 (Dec.) 1930.
2. Van Allen, C. M., and Lindskog, G. E.: Obstructive Pulmonary Atelectasis, Arch. Surgery **21**: 1195 (Dec.) 1930.

Association News

CONTRIBUTIONS FOR MEDICAL SALON IN PERSHING HALL

The sum contributed this week for the Pershing Memorial in Paris brings the total to $2,197.60. A list of those who have contributed during the current week follows:

A. M. Wood, M.D., Shelbina, Mo.
Benjamin W. Stearns, M.D., Unadilla, N. Y., for Whitney H. Joyce, M.D., Unadilla, N. Y., and Ralph H. Loomis, M.D., Sidney, N. Y., both deceased
J. T. McLean, M.D., Altadena, Calif.
Egbert T. Scott, M.D., West Philadelphia, Pa.
Franklin H. Martin, M.D., Chicago
Morris B. Simpson, M.D., Kansas City, Mo.
Luther A. Brown, M.D., Portland, Maine
H. V. Adix, M.D., Gresham, Ore.
J. A. Pettit, M.D., Portland, Ore.
C. C. Hartman, M.D., Pittsburgh
Kellogg Speed, M.D., Chicago
W. Marvin Munsell, M.D., Grandview, Wash.
Kincy J. Scott, M.D., Pharr, Texas
Gilbert Fitz-Patrick, M.D., Chicago
W. W. Kuntz, M.D., Barry, Ill.
Junius C. McHenry, M.D., Edgerton, Wyo.
Alexander Heron Davisson, M.D., Philadelphia
A. B. Montgomery, M.D., Long Beach, Calif.

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts at 10 a. m. on Monday, 10:45 on Tuesday, 9:15 on Thursday and 10:30 on Saturday, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week is as follows:

March 23. Hygienic Adjustment Throughout Life.
March 24. Are Modern Parents Failures?
March 26. Foothall Hero—Ten Years After.
March 28. The Preschool Years.

Five minute health talks may be heard over the Columbia Broadcasting System daily except Sundays and holidays, from 12 to 12:05 p. m., Central Standard Time.

The program for the week is as follows:

March 23. Health and Advertising.
March 24. Ringworm of the Feet.
March 25. Work and Health.
March 26. Work and Health.
March 27. Happiness and Handicaps.
March 28. Happiness and Handicaps.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Bills Introduced.—H. 203 proposes a new pharmacy practice act. Physicians, apparently, are prohibited from dispensing drugs and medicines and may administer them only in emergencies. H. 220 proposes to authorize the establishment of a state tuberculosis sanatorium.

Hospital News.—With the completion of a laboratory, April 1, the new Sage Memorial Hospital, at Ganado in the Navajo Indian reservation, 55 miles northwest of Gallup, N. M., will be in full operation. A gift of $50,000 from the Russell Sage Foundation supplied the funds for the new building. The hospital is conducted by the board of national missions of the Presbyterian church. The building is a two-story stone structure providing for seventy-five beds. Much of the modern equipment was bought with funds given by Indians. The x-ray unit is said to be the only one in an area of nearly 50,000 square miles. The hospital maintains its own gas manufacturing plant to supply fuel gas to the diet kitchens, laboratory and sterilizing rooms.

ARKANSAS

Bill Introduced.—S. 220 proposes that persons who have completed the regular course of study in an accredited high school shall be eligible to enter any medical college in the state.

Society News.—Drs. George E. Cannon, Hope, and Arley D. Cathey, El Dorado, addressed the Tri-County Medical Society (Union, Ouachita and Columbia counties), El Dorado, at the January meeting, on embolism, and epidural infection of the spinal cord, respectively.——The Yell County Medical Society was organized, January 8; Dr. Henry Lee Montgomery, Gravely, was elected president.

Illegal Practitioner Fined.—William Henry Newsom, Louann, was fined $100 in Justice L. W. Bowers' court, Camden, February 20, on a charge of practicing medicine without a license, according to a report from the state medical board. Newsom claimed that he had been graduated from the St. Louis College of Physicians and Surgeons and licensed in Louisiana in 1900 and that he had been licensed in Arkansas in 1903. Newsom's attorney gave notice of an appeal to the circuit court.

CALIFORNIA

University News.—The University of California Medical School will celebrate its semiannual alumni day, March 24; operative clinics will be held and pediatric ward rounds made. At the afternoon session, Dr. John J. Sampson, among others, will speak on "Therapeutic Use of Potassium in Certain Cardiac Arrhythmias." Chauncey D. Leake, Ph.D., will deliver the annual Alpha Omega Alpha Lecture on "The Alchemy of Alcohol."

Probation for Narcotic Violators.—At a meeting of the California Board of Medical Examiners, Los Angeles, February 2-5, Dr. David E. Matzke, San Francisco, was placed on probation for three years, during which time he shall not apply for or have a narcotic permit or have narcotics in his possession. Dr. Walter W. Hopson, Los Angeles, was placed on probation for five years. He was ordered to surrender to federal officers all narcotics in his possession.

Personal.—Bennet M. Allen, Ph.D., professor of zoology, University of California, Los Angeles, has received a grant from the National Research Council to further his investigations of the glands of internal secretion.——Dr. John B. deC. M. Saunders, Edinburgh, has been appointed assistant professor of anatomy in the University of California Medical School.——Dr. James E. Pendergrass, Clovis, has been appointed health officer of Fresno County to succeed Dr. George L. Long, who has held the position for several years.——Dr. Harold P. Muller has been appointed city health officer of Modesto to succeed Dr. James W. Morgan.——Dr. Cecil G. Newbecker has been appointed health officer of Kings County to succeed Dr. Aaron S. Torrens.

Traveling Laboratory Offered to University.—The Southern Pacific Company recently offered the use of a completely equipped laboratory on wheels to the University of California Hooper Foundation for Medical Research to assist in answering emergency calls throughout the state for help in fighting epidemics. The car has been rebuilt to fill the needs of a staff of public health workers, either for emergencies or for routine examinations and educational programs, and is available at any time for use anywhere along the railroad's lines. It has a well equipped bacteriologic and chemical laboratory, an x-ray room with facilities for developing films, a waiting room, examining room, quarters for two physicians and a technician, a galley and combination dining and record room, and quarters for a crew of two. Karl F. Meyer, Ph.D., and Dr. Jacob C. Geiger of the foundation have already made use of the car in demonstrations before various medical associations.

COLORADO

Bills Introduced.—H. 129 proposes to limit the employment of drug store and pharmacy employees to an average of nine hours a day, or to not more than 108 hours in any two consecutive weeks, or to not more than thirteen days in such two consecutive weeks. H. 271 proposes to regulate child-caring agencies and institutions.

Society News.—Drs. Alfred L. Briskman, Colorado Springs, and Clarence B. Ingraham, Jr., Denver, addressed the El Paso County Medical Society, March 11, on "Red Cell Sedimentation in Diagnosis and Prognosis" and "A Consideration of Conditions of American Obstetrics, with Some Local Statistics," respectively.——The Medical Society of the City and County of Denver was addressed, February 17, by Dr. Alfred H. Washburn on "Prevention of Heart Disease in Early Life."——At a meeting of the Colorado Society of Clinical Pathologists, January 17, it was recommended that a prize in clinical pathology be established to be awarded annually to the student who has shown the greatest proficiency in laboratory work in clinical

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pathology at the University of Colorado School of Medicine. The minimum amount of the award was set at $25, the exact amount to be settled each year by a vote of the society. The scientific program at this meeting consisted of a symposium on undulant fever, among the speakers being Drs. Philip Hillkowitz, Denver; Carl W. Maynard, Pueblo; Leo C. Huelsmann, Colorado Springs, and Josephine N. Dunlop, Pueblo.

DELAWARE

Bills Introduced.—S. 163 proposes to authorize the state board of health to appoint a corps of physicians for work in connection with the public school system. Substitute for H. 169, to amend the workmen's compensation act, proposes (1) to permit an injured employee to select his own physician and (2) to strike out the limit on the extent of the medical aid for which an employer is liable. S. 108, to amend the medical practice act, proposes that the medical council shall consist of three separate boards of medical examiners, one board representing the Medical Society of Delaware, one representing the State Homeopathic Medical Society of Delaware State and Peninsula, and one representing the Delaware Osteopathic Association. Osteopathic applicants are to be examined by an osteopathic board in all subjects in which medical applicants are examined, including materia medica, except that the practice of osteopathy is substituted for the practice of medicine. Apparently, all present osteopaths may receive, without examination, unlimited licenses permitting them to prescribe and administer drugs and to practice surgery.

DISTRICT OF COLUMBIA

Dr. Novy Gives Kober Lecture—Dr. Carrel Receives Cancer Prize.—Dr. Frederick George Novy, professor of bacteriology, University of Michigan Medical School, Ann Arbor, will deliver the annual Kober Lecture, March 28, at Gaston Hall, Georgetown University. Dr. Novy's subject will be "Respiration of Micro-Organisms." On the same evening, Dr. Alexis Carrel of the Rockefeller Institute for Medical Research, New York, will receive the Dr. Sofie Nordhoff-Jung Cancer Prize of $1,000. Baron Friedrich von Prittwitz, German ambassador to the United States, will make the presentation.

ILLINOIS

Bills Introduced.—S. 197 proposes to regulate the practice of massage and physiotherapy and to authorize the department of registration and education to license such practitioners to use manual, physical and mechanical measures, and all natural methods for therapeutic purposes. S. 191 proposes to repeal that section of the pharmacy practice act which provides that no person may purchase, lease, acquire or establish a drug store or pharmacy except (1) a registered pharmacist, (2) a partnership, an active member of which is a registered pharmacist or (3) a corporation, each officer of which is a registered pharmacist. H. 453 proposes to make it unlawful "for any person to experiment or operate in any manner whatsoever upon any living dog, for any purpose other than the healing or curing of said dog."

Society News.—Drs. Sandor Horwitz and William A. Hinckle were the speakers at the meeting of the Peoria City Medical Society, February 17, on "Medicine as Practiced by the Early Hebrews and Jews during the Bible and Talmudic Times" and "Anal Rectal Abscess and Fistula." Dr. Noble Sproat Heaney, Chicago, spoke, March 3, on endometriosis. ——Dr. Nelson M. Percy, Chicago, addressed the Will-Grundy Counties Medical Society, Joliet, March 4, on goiter. Dr. James H. Hutton spoke, March 11, on "Endocrine Factors in and Endocrine Control of Obesity."——Drs. Andrew C. Ivy and William R. Cubbins, Chicago, addressed the Sangamon County Medical Society, Springfield, March 5, on the cause of gallstones, and "Fractures—Conservative and Operative Treatment."——Dr. Ernest Sachs, St. Louis, addressed the Adams County Medical Society, February 9, on "Diagnosis and Present-Day Treatment of Brain Tumors."

Chicago

Personal.—George P. Dreyer, Ph.D., professor of physiology and head of the department of physiology and physiologic chemistry at the University of Illinois College of Medicine since 1900, died, February 27, aged 64. Prof. Dreyer received his doctorate from Johns Hopkins University in 1890 and taught there for ten years. His best known research was the discovery of the secretory nerves of the suprarenal glands.

Dr. Meyer to Give Hektoen Lecture.—Karl F. Meyer, Ph.D., director of the George Williams Hooper Foundation for Medical Research, University of California, will deliver the seventh Ludvig Hektoen Lecture of the Billings Foundation before the Institute of Medicine of Chicago in the City Club, April 24. Dr. Meyer will speak on "The Animal Kingdom—A Reservoir of Disease."

Professor Evans Will Give Bacon Lectures.—Dr. Herbert A. Evans of the University of California Medical School will give the annual Charles Sumner Bacon Lectures at the University of Illinois College of Medicine. The first lecture, March 31, will be given at 4 p. m. on "The Hormones of the Hypophysis," and the second, April 1, at 1 p. m., on "The Relation of the Hypophysis to the Reproductive System." These lectures will be given in the library of the college of medicine at 1817 Polk Street. The public is invited.

INDIANA

Reciprocity Rescinded.—The state board of medical registration and examination has canceled its reciprocity agreement with the department of registration and education of Illinois on the ground that Illinois requires of applicants for reciprocity a clinical examination in addition to the credentials presented on application.

IOWA

Society News.—Dr. Louis D. McGuire, Omaha, addressed the Waterloo Medical Society, February 17, on "Sodium Amytal Compared with Other Anesthetics."——At the organization meeting of the Iowa Academy of Ophthalmology and Oto-Laryngology, February 12, in Des Moines, Dr. Gordon F. Harkness, Davenport, was elected president; Dr. Harold J. McCoy, Des Moines, vice president, and Dr. William F. Boiler, Iowa City, secretary. Among the speakers on the program were Drs. Thaddeus A. Minassian, Des Moines, "Tongue Lesion: Differential Diagnosis Between Carcinoma and Syphilis"; James A. Downing, Des Moines, "Laryngeal Diphtheria," and Cecil C. Jones, Des Moines, "Acute Suppurative Mastoiditis Bilateral with Brain Abscess."

Bill Introduced.—H. 398 proposes to amend that portion of the state prohibition act allowing dentists to use alcohol for the purpose of sterilization, annealing gold or other like nonbeverage purposes, by allowing them to use such intoxicating liquor in accordance with federal statutes or regulations, or in accordance with state statutes, as is necessary in their professional practice and for sterilization and laboratory purposes. H. 340 proposes to amend the osteopathic practice act in several important respects. Persons treating human ailments by manipulation of the limbs, muscles, ligaments and bones, in order to correct displacements and abnormalities of the body, are to be deemed to be engaged in the practice of osteopathy. Applicants for licenses to practice osteopathy and surgery, in addition to showing the qualifications required for licenses to practice osteopathy alone, must (1) present satisfactory evidence that they have completed a course of study equivalent to that required for practitioners of surgery licensed under the provisions of the law relating to medicine and surgery, (2) pass the examination required of practitioners of surgery licensed under the provisions of the law relating to medicine and surgery, and (3) present satisfactory evidence that they have completed a one year's internship. Licenses to practice osteopathy are not to authorize the licentiates to give any vaccines, serums, drugs or medicines included in materia medica. Licenses to practice osteopathy and surgery, however, are to entitle the holders to prescribe and furnish such drugs as may be necessary to carry on their practice as osteopathic surgeons. Under the present law, osteopaths or osteopathic surgeons may not prescribe nor give internal curative medicines.

KANSAS

Bills Introduced.—S. 377 proposes that boards of education in cities of more than 120,000 may provide free medical inspection for the school children. H. 636, to amend the chiropractic practice act, proposes to require the annual registration of chiropractors and the payment of an annual fee of $5.

Society News.—The Wyandotte County Medical Society was addressed, March 3, by Drs. Thomas G. Orr and Louie F. Barney on "Water and Chemical Balance in Surgery" and "Treatment of Acute Generalizing Peritonitis," respectively. The society was addressed, March 17, by Drs. Paul M. Krall on "Practical Aspect of Endocrinology," and Robert M. Isenberger, "Experimental Developments in the Pharmacology of Endocrine Gland Products."

MAINE

Bill Introduced.—H. 683 proposes that no person, firm, organization or corporation shall engage in the practice of any healing art without being legally licensed to do so.

MARYLAND

Personal.—A sound film of Dr. John Jacob Abel of Johns Hopkins University School of Medicine, Baltimore, lecturing on the relation of pharmacology to chemistry, is being made under the auspices of the Chemical Foundation of New York and Johns Hopkins University.——Dr. Maurice C. Pincoffs was recently elected president of the Mental Hygiene Society of Maryland.——Dr. James MacFaddin Dick, chief of staff of the Peninsula General Hospital, Salisbury, was presented with the 1930 Salisbury award, which is a gold medal given annually to the citizen who is considered the greatest benefactor to the community.

Bills Introduced.—H. 232 proposes that when the immediate removal of the body of a deceased person who has died from natural causes is necessary, removal from the place of death may be authorized by the registrar of vital statistics or his deputy, without a certificate of death from the attending physician, if that physician is not available. H. 261 proposes a new osteopathic practice act. It defines osteopathy as "that system of the healing art which places the chief emphasis on the structural integrity of the body mechanism as being the most important single factor to maintain the well-being of the organism in health and disease." Two types of licenses are proposed: (1) a license to practice as an osteopathic physician and (2) a license to practice as an osteopathic physician and surgeon. Applicants for licenses to practice surgery are to be examined in surgery by the osteopathic board. Osteopathic physicians are to observe and be subject to all state and municipal regulations relative to reporting births and deaths and all matters pertaining to the public health, with equal rights and obligations as physicians of other "schools of medicine," and such reports must be accepted by the officers of the department to which such reports are made. Osteopathic physicians or osteopathic physicians and surgeons are furthermore, under this bill, to have the same rights as physicians and surgeons of other schools with respect to the treatment of cases or the holding of offices in public institutions.

MASSACHUSETTS

Bill Introduced.—H. 1175, to amend the workmen's compensation act, proposes to define incapacity as "such incapacity for work as results from a physical injury arising out of and in the course of the employment of the employee, but not including the results of a preexisting disease."

License Restored.—The board of registration in medicine reports that the license of Dr. Robert E. Conlin, Somerville, to practice medicine in Massachusetts was restored, Dec. 11, 1930. The license was revoked, Feb. 3, 1927, on account of the performance of an abortion (THE JOURNAL, April 23, 1927, p. 1328).

Society News.—Dr. Charles G. Mixter, Boston, addressed the Greater Boston Medical Society, February 3, on "Rôle of Obstructive Lesions in the Urinary Infections of Childhood."——Dr. Frank H. Washburn, Holden, delivered the George Washington Gay lecture at Tufts Medical School, Boston, March 4, on "Rôle of Ethical Conduct in the Successful Medical Career."——Dr. Samuel R. Meaker addressed the William Harvey Society, Boston, March 13, on "Social Aspect of Gynecology"; Drs. Herbert S. Hutchinson, Milford, N. H., and Henry A. Christian will address the society, April 10, on "The Old and New in General Practice."——Dr. Edward M. Hodgkins, Boston, addressed the Watertown Medical Club, March 2, on "Changing Conception in the Operative Treatment of Inguinal Hernia."

MICHIGAN

Bill Introduced.—S. 74 proposes to regulate the practice of cosmetology and to permit practitioners, among other things, to remove superfluous hair from the upper part of the body by the use of electrolysis, depilatories, waxes or tweezers.

Prizes for Essays on Industrial Medicine.—The board of directors of the Michigan Association of Industrial Physicians and Surgeons has announced a competition for essays on subjects bearing on industrial medicine or surgery. The honorarium offered for the first prize essay will be $50, and for the second best, $25. The essays must contain a minimum of 1,000 words and a maximum of 3,000. The object of this competition is to encourage interns to emphasize reparative surgery while serving under the direction of competent surgeons. All interns and resident house officers in Michigan hospitals are eligible. Essays must be sent to the secretary of the Michigan Association of Industrial Physicians and Surgeons, Dr. Frank A. Poole, 620 State Office Building, Lansing, by April 1.

MINNESOTA

Society News.—Dr. Clay Ray Murray, New York, addressed the Hennepin County Medical Society, February 4, on "General Treatment of Fractures."——The Ramsey County Medical Society formally opened its new quarters and library rooms, February 27; Dr. Oscar W. Holcomb, president of the society, made the opening address. Drs. John M. Armstrong, Henry Longstreet Taylor, St. Paul, and Alfred J. Brown, Omaha, also spoke.——Dr. Frank E. Burch, St. Paul, gave an illustrated address on strabismus before the Washington County Medical Society, February 10.——Drs. Walter E. Camp, Minneapolis, and Elmer M. Jones, St. Paul, addressed the Minnesota Academy of Medicine, Minneapolis, March 11, on "Pathology and Pathogenesis of Ocular Melanomata" and "Phlegmonous Enteritis," respectively.

Bills Introduced.—S. 335, if enacted, would, apparently, repeal the provision of the pharmacy act that allows any general dealer whose shop is more than two miles from a drug store to sell any commonly used medicines or poisons that have been put up by a registered pharmacist for that purpose. S. 621, to amend the chiropractic practice act, proposes (1) to allow the board of chiropractic examiners and the Minnesota American Chiropractic Association to determine the annual license fee to be paid by chiropractors; (2) to accord chiropractors all the rights and privileges of other physicians in all matters pertaining to the public health, "including methods of natural healing or physical therapy," except prescribing internal drugs, and (3) to add to the present causes for the revocation of licenses the claiming of superiority over any other chiropractor and failure to designate to the public, by using terms or letters Doctor of Chiropractic or D.C., that the chiropractor is practicing under a chiropractic license. H. 499 proposes to authorize cities of the fourth class to establish and maintain city hospitals. H. 890, to amend the optometry practice act, proposes to eliminate from the act the statement of certain practices now designated as unlawful, such as itinerant vending of spectacles and the sale of eyeglasses in an established place of business not under the supervision of a duly licensed optometrist or physician.

MISSISSIPPI

Society News.—Drs. Francis M. Smith and Leon S. Lippincott, Vicksburg, addressed the Issaquena-Sharkey-Warren Counties Medical Society, February 10, on "The Carrier and Contact Problem" and "Why Examine the Urine?" respectively.

Counties Named for Health Units.—The establishment of full time health units in Lauderdale and Pike counties has been assured, it is reported, as a part of the public health program of the Commonwealth Fund. To supplement the fund's appropriation of $22,500, Pike County gave $5,000, the town of McComb, $2,900, and the towns of Magnolia, Summit and Osyka, each $200. Figures were not mentioned for the Lauderdale unit. It is also planned to provide a central field unit for rural health work with headquarters in Jackson. This work will be done by the fund in cooperation with the state board of health. Mississippi is the third state to be selected by the Commonwealth Fund for cooperative health work, similar projects having already been started in Tennessee and Massachusetts.

Provisional Approval of Medical School.—Early in July, 1930, reports were received indicating that sweeping changes had been made, probably through political maneuvering, in the faculty of the University of Mississippi School of Medicine. The Council on Medical Education and Hospitals of the American Medical Association called the attention of the governor of Mississippi to the fact that the institution recognized by the Council no longer existed in fact, and that before a new institution could be recognized it would need to be thoroughly inspected. This was followed, however, by the prompt restoration of most of the original personnel to their positions on the medical faculty. At its business meeting, Oct. 15, 1930, therefore, the Council voted that the approval of this medical school be held in abeyance until the effect of the recent changes could

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be determined. Since that time the Council has received considerable correspondence from prominent physicians and others in Mississippi requesting the Council to hold the approval of this school in abeyance until the next governor and legislature of Mississippi are elected, which will be in January, 1932, after which it is expected that favorable developments will occur. After due consideration, the Council, at its meeting, February 15, voted that the approval of the school be continued provisionally pending further developments.

MISSOURI

Society News.—Dr. Virgil E. Simpson, Louisville, Ky., addressed the Jackson County Medical Society, March 10, Kansas City, on "Mendelian Law in Medicine."——Among others, Dr. Kerwin W. Kinard gave an illustrated address on "Newer Conception of the Function of the Thyroid" before the Kansas City Southwest Clinical Society, March 10, and Dr. Edwin H. Schorer spoke on "Diagnosis and Management of Pneumonia in Children."

Bills Introduced.—S. 345 proposes to repeal the workmen's compensation act. S. 377 proposes to authorize the establishment of a hospital for convicts suffering from tuberculosis and other lingering diseases. S. 378 proposes to create a division of mental diseases in the state board of health. H. 483 proposes to abolish the licensing of assistant pharmacists and to provide that persons now licensed as assistant pharmacists may make application to the board of pharmacy prior to Dec. 31, 1931, and be licensed as registered pharmacists, without examination. S. 222, to amend the workmen's compensation act, proposes that the employer shall be liable for such medical aid as shall be reasonably required to be rendered the injured employee for the first ninety days after the injury, in a sum not exceeding $750, and thereafter such additional medical aid as the compensation commission may determine to be necessary. S. 419 proposes to require that all drugs of coal tar origin, intended for either internal or external human use, be plainly labeled with the true English name and to show that they are of coal tar origin, and with a statement of the dangerous effects of their use, and the names of at least two active antidotes. The provisions of the bill, however, are not to apply when such drugs are prescribed by a licensed physician. H. 594 proposes to provide for the sexual sterilization of certain inmates of state institutions.

NEVADA

Society News.—Dr. Joseph Marion Weldon, Mobile, Ala., addressed the Washoe County Medical Society, Reno, recently, on toxemias of pregnancy. At the same meeting Dr. George R. Smith, read a paper prepared by Dr. Philip F. Schneider, Evanston, Ill., on the hormone test for early pregnancy.

Bills Introduced.—S. 77 proposes to regulate the practice of barbering and would, if enacted, permit such practitioners to remove superfluous hair by the use of electrolysis, depilatories or tweezers. A. 101 proposes to include marihuana among the substances classed as narcotics within the meaning of the narcotic act. A. 161 proposes to repeal the law authorizing counties to establish and maintain public hospitals.

NEW JERSEY

Society News.—Dr. Felix Baum, Newark, addressed the William Pierson Medical Society, Orange, February 20, on "Modern Tuberculosis Problems with Special Reference to Treatment."——Dr. Aaron S. Price, New York, addressed the Summit County Medical Society, January 27, on "The Clinical Interpretation of Differential Blood Count."——Dr. Ernst P. Boas, New York, addressed the Atlantic County Medical Society, March 13, at Atlantic City on "Rheumatic Fever."

Health at Trenton.—Telegraphic reports to the U. S. Department of Commerce from eighty-one cities with a total population of 36 million, for the week ended March 7, indicate that the highest mortality rate (25.7) appears for Trenton, and the rate for the group of cities as a whole, 13.8. The mortality rate for Trenton for the corresponding period in 1930 was 16.5 and for the group of cities, 13.8. The annual rate for the eighty-one cities for the ten weeks of 1931 was 14.2, as against a rate of 13.4 for the corresponding weeks of 1930. Caution is necessary in the interpretation of these figures, as weekly figures fluctuate widely. The fact that some cities are hospital centers for large areas outside the cities or that they have large Negro populations may tend to increase the death rate.

NEW MEXICO

Bills Introduced.—S. 117 proposes to regulate the practice of chiropody, defined as the local, medical, mechanical, or surgical treatment of ailments of the human foot, except through the use of the knife (such as amputation of the foot or toes), the use of anesthetics other than local, and the use of drugs or medicines other than local antiseptics. It proposes to create for this purpose a "board of masseur chiropody," to consist of one chiropodist and two medical practitioners. S. 94 proposes a new state narcotic control act.

NEW YORK

Bills Introduced.—S. 993 and A. 1362 propose to create in the state department of health a division of orthopedics and a division of cancer control. S. 1047 proposes that each local registrar of vital statistics shall be paid 50 cents, and each physician and midwife, 25 cents, for each birth certificate registered, and 25 cents for each death certificate. S. 1069 proposes to regulate the practice of barbering. A. 1421 proposes to provide that each certificate of birth shall contain a photograph of the finger prints of the mother and the foot prints of the child. The impression is to be taken as soon after the birth as is practicable. A. 1500 proposes to authorize the licensing of nurses' registries in New York City by the mayor. A. 1571 proposes to make it unlawful for any person in any way to distribute bichloride of mercury, mercuric chloride or corrosive sublimate, except on the written prescription of a licensed physician.

Report on Effects of Noise in Industry.—Results of a study to determine the effects of noise on the hearing of industrial workers have been published recently by the Bureau of Women in Industry of the New York state department of labor. Tests were made with an audiometer on 1,040 workers in seven factories and in two groups of clerical workers. Deafness was found in 246, or 23.7 per cent. Of this number 91 had some history of ear trouble that might have caused the deafness. Only 155 remained, therefore, in whom the condition might be related to their work. The greatest number of deafened persons were found in the group of workers subjected to the greatest amount of noise. Most of these, 66 out of 96, worked in a factory making tin cans, in a room dominated by the noise of a stamping machine. In the 155 cases of deafening without any history to account for it, 69 occurred in persons between 21 and 30 years. Of workers employed less than one year, 6 per cent were deafened without a history of disease to account for it. Among those employed between one and five years the percentage was 16.1, but in the next group, those exposed for between five and ten years, it was 12.8. Thereafter the percentage increased up to 26.9 per cent for those exposed for more than twenty-five years. The investigators pointed out, however, that advancing age was probably a factor in this increase. At the conclusion of the study the investigators recommended (1) that tests of hearing be made on all new employees, (2) that periodic examinations be made where there is an undue amount of noise, (3) that certain types of machines be isolated and (4) that adequate ventilation be provided to remove vapors, which were found to have an effect on the hardening of cerumen in the ears of workers.

New York City

Society News.—Dr. Joseph Colt Bloodgood, Baltimore, will address the Medical Society of the County of Queens, March 24, instead of March 6, as noted in THE JOURNAL, March 14.

Resolution Opposing Coffey-Humber Cancer Institute.—A resolution adopted in January by the New York Academy of Medicine, deprecating a proposal by the Better Health Foundation to establish a laboratory at Huntington, L. I., for research on the Coffey-Humber treatment of cancer with extract of suprarenal cortex, was made public at a hearing, March 10, before a special committee of the state board of social welfare. The academy believed the establishment of such an institute to be an unwise move. Citing the experience that followed the announcement of this treatment in California, when many hopelessly ill persons abandoned treatments known to be beneficial and made great sacrifices to get to the Coffey-Humber clinic, yet were not much benefited, the academy recommended that these physicians follow the plan used by Banting and Best in establishing the value of insulin. This would place the Coffey-Humber extract in the hands of competent scientists and physicians who would, under the best

facilities, conduct scientific studies of the effects both clinically and experimentally. The resolution concludes:

A few patients carefully observed with detailed study of all reactions will yield far more valuable results than a less controlled use of the remedy on a number of patients too large for such a study. For these reasons the New York Academy of Medicine further believes that there is no need for the creation of a new experimental and clinical institute for this study, since ample facilities are already available in established cancer institutes and hospitals.

Hospital News.—A compressed-air lock for the treatment of compressed-air disease will be added to the equipment of Metropolitan Hospital on Welfare Island, having been provided for with a $15,000 appropriation by the board of estimate, March 6. It will be used also for the study of the effect of compressed air on the human system, and will be operated under the direction of Dr. Thomas McG. Lowry.——The $2,000,000 ten story Columbus Hospital was officially opened, February 11; it has been under construction for two years and has a capacity of 250 beds. It was opened for patients, March 1.——The department of urology of the New York Hospital recently received $197,081.80 by the will of the late Gustavus L. Lawrence. Proceeds from this sum will be applied to the needs of the department and will be kept in a separate fund to be known as the Gustavus L. Lawrence Fund.——The Jacob Fuhs Auditorium in the pathologic institute of the United Israel-Zion Hospital, Brooklyn, was formally dedicated, March 1, with an address by Dr. Frank D. Jennings, representing the Medical Society of the County of Kings. Dr. Fuhs, who died in 1927, was for many years on the staff of the hospital.——A new laboratory building for clinical diagnosis and research in pathology, bacteriology, pharmacology and physiology was dedicated, March 5, at the Long Island College Hospital, Brooklyn. The building, constructed at a cost of $125,000, is the gift of Dr. John Osborn Polak, professor of obstetrics and gynecology in the medical college. Dr. Willard C. Rappleye, dean of the Columbia University College of Physicians and Surgeons, made the dedicatory address.

NORTH CAROLINA

Society News.—A Radiological Society of North Carolina was recently organized at Durham with Drs. John K. Pepper, Winston-Salem, as president; William T. Rainey, Jr., Fayetteville, vice president, and Major I. Fleming, Rocky Mount, secretary. The next meeting will be held during the annual session of the Medical Society of the State of North Carolina at Durham, April 21. It is intended that two scientific meetings will be held each year and an annual business meeting during the session of the state medical society.

Bills Introduced.—S. 280 proposes to amend the law requiring male applicants for marriage licenses to present certificates from physicians certifying the absence of venereal disease, of tuberculosis in infectious stages and of epilepsy, by requiring such a certificate from both male and female applicants. S. 333 proposes to permit any two or more counties to establish a district hospital home for the aged and infirm in lieu of separate county homes. H. 716 proposes to allow physicians to prescribe medicinal liquor under the same general restrictions as appear in the Volstead Act. H. 692 proposes to prohibit the distribution of hypnotic drugs except on written prescriptions of licensed physicians. Hypnotic drugs are defined to include "sulphonmethane, sulphonethylmethane, diethyl sulphonedrethylmethane, diethyl barbituric acid (barbital), and chloral hydrate or any solution thereof containing 20 grains or more to the fluidounce."

OHIO

Dr. Reid to Succeed Dr. Heuer at Cincinnati.—Dr. Mont R. Reid, associate professor of surgery in the University of Cincinnati College of Medicine, was appointed head of the department of surgery by the trustees of the university, March 3. He will succeed Dr. George J. Heuer, who will go to New York at the end of the present academic year to become surgeon-in-chief of the New York Hospital and professor of surgery in Cornell University. Dr. Reid graduated from the Johns Hopkins University School of Medicine in 1912.

Bills Introduced.—S. 263 proposes to provide medical and surgical treatment and hospital care for indigent persons, in university hospitals, and to utilize such hospitals in the care and treatment of wards of the state. S. 283, to amend the workmen's compensation act, proposes to define injury to include any injury received in the course of employment or any disability caused by illness or disease which arises out of or is the result of such employment. H. 585 proposes to create a board of chiropractic examiners and to regulate the practice of chiropractic, defined as "the science of diagnosing, locating and correcting interference with nerve transmission and physiological response without the use of drugs or major surgery."

Society News.—Dr. Louis J. Karnosh, Cleveland, addressed the Toledo Academy of Medicine, February 6, on "The Neurology of Emotions."——Dr. Joseph A. Capps, Chicago, addressed the Cleveland Academy of Medicine, February 20, on "Pleural, Pericardial and Peritoneal Pain," and Dr. William H. Weir, "Technic of Hysterectomy."——Dr. Erwin von Graff, professor of obstetrics and gynecology at the faculty of medicine, University of Vienna, Austria, conducted clinics at the meeting of the Eighth District Medical Society, Zanesville, February 19.——Dr. Leonard A. Stack spoke on spinal anesthesia before the Lorain County Medical Society, February 10. Dr. Gerald S. Shibley, Cleveland, among others, addressed the society, January 13, on etiology of the common cold.——Dr. Louis N. Katz, Chicago, addressed the Hancock County Medical Society, Findlay, February 4, on the use of the electrocardiogram in clinical medicine.——Dr. Frank Seinsheimer, Cincinnati, spoke on prevention and early diagnosis of contagious diseases in children before the Clark County Medical Society, Sidney, February 11.——Dr. Roy W. Scott, Cleveland, presented an address before the Summit County Medical Society, Akron, March 5, on "Heart Disease, Chief Barrier to Longevity."——Dr. George M. Curtis, Chicago, addressed the Academy of Medicine of Cincinnati, January 19, on "Chloride Metabolism in Relation to Surgery."——Dr. Harry E. LeFever, Columbus, addressed the Fayette County Medical Society, Washington Court House, January 8, on diagnosis and treatment of head injuries.——Drs. Percy S. Pelouze, Philadelphia, and Harold N. Cole addressed the Academy of Medicine of Cleveland, March 20, on "Gonorrhea and Its Treatment," and "Bismuth Salts in the Treatment of Syphilis," respectively.

PENNSYLVANIA

Bill Introduced.—S. 324 proposes to regulate the practice of chiropody and create a board of chiropody examiners. The practice of chiropody or podiatry is defined as the diagnosing of all ailments of the human foot, and the medical, surgical and mechanical treatment of such ailments, except the correction of deformities requiring the use of the knife, amputation of the foot or toes, or the use of any anesthetic other than local.

Society News.—Dr. Morris A. Slocum, Pittsburgh, among others, spoke on "Cultivation and Sterilization of Fly Larvae and Their Use in the Treatment of Chronic Osteomyelitis" before the Allegheny County Medical Society, March 17.——Dr. Thomas B. Holloway, Philadelphia, delivered the Stewart Memorial Lecture, March 10, before the Pittsburgh Academy of Medicine, on "Certain Pathological Conditions About the Chiasm, with Special Reference to Pituitary Adenomata."

Philadelphia

Society News.—Dr. Alfred F. Hess, New York, gave the Frederick A. Packard Memorial Lecture before the Philadelphia Pediatric Society, March 10, on "Ultraviolet Irradiation, Irradiated Ergosterol and Irradiated Foods."——Dr. Collier F. Martin delivered the weekly seminar lecture under the auspices of the Philadelphia County Medical Society, March 13, on "Diagnostic Symptoms in Anorectal Disease."——Dr. Warren H. Lewis, Baltimore, presented a motion picture of tissue cultures of human and mammalian tumor cells before the Pathological Society of Philadelphia, March 12.——The Philadelphia Psychiatric Society devoted its meeting, March 13, to a discussion of schizophrenia; speakers included Drs. James Hendrie Lloyd, Joseph C. Yaskin, Bernard J. Alpers, Edward A. Strecker and Earl D. Bond.

SOUTH CAROLINA

Bills Introduced.—H. 375 proposes to provide dental clinics for the public schools of the state and to authorize the employment of school dentists. H. 554 proposes to discontinue the school of pharmacy at the University of South Carolina after the scholastic year 1930-1931. H. 573 proposes to allow physicians to prescribe intoxicating liquors under the same general restrictions as appear in the Volstead Act.

Society News.—Dr. Horton R. Casparis, Nashville, Tenn., addressed the South Carolina Pediatric Society at Columbia, January 14, on "Recent Advances in the Treatment of Infectious Diseases"; other speakers included Drs. Thomas D. Dotterer, Columbia, on "Intracranial Injuries of the New-

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Born" and Richard M. Pollitzer, Greenville, "Acute Lymphatic Leukemia." Dr. Edward W. Barron, Columbia, was elected president of the society.

SOUTH DAKOTA

Bill Introduced.—H. 323 proposes to levy annual occupational taxes of from $10 to $50 on licensed and practicing physicians and surgeons.

Hospital News.—St. Mary's Hospital, Pierre, which was recently dedicated, has a capacity of 100 beds, and was built at a cost of more than $200,000.

TEXAS

Bills Introduced.—S. 421 proposes to authorize the establishment of a tuberculosis sanatorium for Negroes in a location to be selected by the board of control. S. 483 proposes to create a commission to inquire into and report on the number, distribution and condition of crippled children and physically disabled adults in the state. S. 488 proposes to accord liens to hospitals and physicians on any insurance benefit due persons treated by physicians or hospitals. H. 202 proposes to create a board of chiropractic examiners and to regulate the practice of chiropractic. H. 295, to amend the law requiring the licensing of maternity hospitals and homes, proposes to make it a misdemeanor (1) to operate such an institution without a license from the state board of health; (2) to sell or traffic in babies, and (3) to maintain in said institutions tuberculous or mentally unbalanced persons, or persons suffering from infectious or contagious diseases. H. 407 proposes to create the Dallas State Hospital, to be composed of the Dallas Psychopathic Hospital and the State Cancer and Pellagra Hospital.

UTAH

Society News.—Dr. William L. Bender, San Francisco, addressed the Box Elder County Medical Society, Brigham, recently, in a joint meeting with the Cache Valley and Weber County Medical societies, on "Anterior Poliomyelitis and Encephalitis."——Dr. Charles C. Johnson, Salt Lake City, presented a paper on "Pharmacologic and Toxic Effects of Sodium Nitroprusside" before the Utah County Medical Society, Provo, recently.

Bills Introduced.—S. 43, to amend the workmen's compensation act, proposes to authorize employers to enter into "agreements respecting hospital benefits and accommodations, and medical and surgical services, nursing and medicines, and services to be furnished of licensed practitioners not using drugs or medicines." H. 151, to amend the narcotic act, proposes to make it unlawful for any person "to unlawfully procure, or make, execute, sign, or to advise, assist, or aid in the false or fraudulent execution of any order or prescription, or to forge the name of any duly licensed physician, dentist, veterinarian or other duly authorized person to any order or prescription for any of the narcotics or drugs enumerated" in the act.

VIRGINIA

University News.—The Stuart McGuire Lecture for 1931 will be given, March 25, at the Medical College of Virginia, Richmond, by Samuel Alfred Mitchell, Ph.D., professor of astronomy and director of the Leander McCormick Observatory at the University of Virginia on "Eclipse Hunting in the South Seas." This lectureship was established in 1930 in recognition of the services to the college, to medical education and to surgery of Dr. McGuire, who is emeritus professor of surgery.

WASHINGTON

Illegal Practitioner Fined.—C. Irving Grieger was arrested in Chehalis, February 17, charged with practicing medicine without a license. He was fined $25 and costs. Grieger, who also posed as a chiropractor, has appealed, it is reported.

New Hospital Bans Drugless Healers.—The drugless healers of Seattle and King County were informally notified, February 26, it is reported, that they had lost their fight to be permitted to practice in the new $2,500,000 Harborview Hospital, which was dedicated on the same date. The new city and county institution has a 450 bed capacity.

Bills Introduced.—S. 184 proposes to authorize counties or counties and cities to operate hospitals jointly. S. 204, to amend the chiropody practice act, proposes that a person fitting, recommending or selling corrective shoes, arch supports or similar mechanical appliances shall not be deemed to be engaged in the practice of chiropody. S. 228 proposes to make it unlawful to deliver to the same person in any twenty-four hour period more than 4 ounces of sweet spirit of niter.

WEST VIRGINIA

Personal.—Dr. Andre Crotti, Columbus, Ohio, delivered the first annual memorial lecture of the Medical Review Society, Huntington, January 29, given in honor of the late Dr. Claude Aubra Lathem, on goiter. The Medical Review Society is described as a local organization founded ten years ago by local members of the Cabell Medical Society, the membership being restricted to twenty and by invitation. Dr. Lathem's death was the first in the organization and a series of public lectures was instituted as a memorial.

Bills Introduced.—H. 377 proposes to require male applicants for marriage licenses to file an affidavit that they are free from contagious venereal diseases and that they believe their proposed mates to be likewise free. In the event that the marriage license clerk is not satisfied as to the matters alleged in said affidavits, he may require certificates from duly licensed physicians. H. 51 proposes to create a board of barber examiners and to regulate the practice of barbering. S. 146, to amend the chiropody practice act, proposes to define chiropody as the medical, mechanical and surgical treatment of the ailments of the human hand or foot (except the amputation of the foot, hand, toes or fingers), without the use of anesthetics other than local. It is to include also the fitting or recommending of appliances, devices or shoes for the correction or relief of minor foot ailments; provided, that the act shall not be deemed to prohibit the sale of foot appliances and remedies by retail dealers. H. 359 proposes to require all hospitals, under certain circumstances, to treat the indigent sick and to allow any hospital rendering such service to set off the charge against taxes due on real estate or personal property.

WYOMING

Society News.—Dr. John R. Nilsson, Omaha, addressed the Sweetwater County Medical Society recently on fractures; he also showed a motion picture on "Bloodless Cesarean Section." Dr. Russell H. Kanable, Basin, recently addressed the society on "Diagnosis and Treatment of Incipient Tuberculosis."

GENERAL

Society News.—At the annual meeting of the Pacific Coast Surgical Association at Victoria, B. C., February 27-28, Dr. Rea E. Smith, Los Angeles, was elected president; Drs. Charles M. Fox, San Diego, Calif., and Raymond E. Watkins, Portland, Ore., vice presidents, and Dr. Edgar L. Gilcreest, San Francisco, secretary, reelected. The seventh annual meeting of the association will be held, Feb. 26-27, 1932, at Coronado, Calif. There will be two days of clinics in Los Angeles preceding this meeting. Dr. James Tate Mason, Seattle, gave an illustrated address at the annual association dinner on "Seattle's First Physician."

Diplomas Lost.—Two graduates of the University of Tennessee College of Medicine, Drs. Charles D. Brunt, New Castle, Pa., and Bedford F. Floyd, Jr., Kilgore, Texas, have recently reported the loss of their diplomas. Dr. Brunt reported that his diploma, issued June 10, 1929, disappeared from his room in a hospital after he had placed it under some magazines to flatten out a wrinkled corner. Dr. Floyd stated that his diploma, issued June 16, 1927, was left at the home of his mother in Senatobia, Miss., in June, 1928, and when he looked for it in December, 1930, he was unable to find it. Dr. Floyd's Tennessee license to practice medicine was lost at the same time.

Itinerary to Philadelphia Meeting of Otolaryngologists.—The American Board of Otolaryngology is sponsoring a special itinerary beginning with its examination in Los Angeles, May 27, and concluding with the meeting of the American Otological Association in Briarcliff, N. Y., June 17-19. The itinerary, via the Union Pacific System and Wabash and Pennsylvania railroads, includes the meetings of the Pacific Coast Society in Los Angeles, May 28-30; the American Laryngological-Rhinological-Otological Society, St. Louis, June 3-5; American Bronchoscopic Society, St. Louis, June 6; American Medical Association, June 8-12, in Philadelphia; American Laryngological Association, Atlantic City, June 15-17, and the American Otological Association in Briarcliff, N. Y., June 17-19. Further information may be obtained from Dr. William P. Wherry, secretary, American Board of Otolaryngology, 1500 Medical Arts Building, Omaha, Neb.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Feb. 21, 1931.

Recrudescence of Cerebrospinal Fever

Cerebrospinal fever, which has recently been reported in various parts of the world, has now been observed in England. Periodic increases in the incidence of this relatively rare disease are not unusual. The total notified cases in England and Wales in 1929 was 650, which is above the average, and in 1930, 666. In the present year 230 cases have already been reported among civilians. They have shown a scattered distribution over thirty-six counties, but there has been some concentration in the West Riding of Yorkshire, where seventy-nine cases have occurred. In the army a local prevalence of influenza has been associated with a number of cases of cerebrospinal meningitis. Thus, since January 31, thirteen cases have been notified in the Aldershot Command and six among the Air Force at Uxbridge. At Aldershot, with the exception of a fatal case in a nurse in attendance on patients suffering from the disease, all the cases occurred in men who had had influenza. They belonged to various units and did not come from any one regiment or building. Eight of the Aldershot cases have been fatal. In a London barracks a guardsman has died from the disease. The frequent association of the disease with military establishments is a curious phenomenon for which no explanation is forthcoming, since the hygiene of the buildings and the good health and physique of their occupants are undeniable. However, during the war years it was found that when more room was given the men to live and sleep in the incidence of the disease fell.

The Rule Not to Move a Patient Before Giving First Aid

A schoolmistress recently was run down by a motorcycle in London and, while lying on the ground and being attended, she was run into by an automobile. She appeared to be suffering from concussion and had scalp and face wounds. While the attendant was bandaging the wounds as she lay on the roadway, an automobile was driven through the onlookers, caught the patient, and carried her several yards. She died two hours after admission to a hospital. The driver, a captain of artillery, was arrested for being drunk while in charge of an automobile and was tried for manslaughter but was acquitted. The jury said that there was negligence on the part of the ambulance men, while the judge added that it was wrong practice to bandage people in the middle of the road. Sir William Willcox, the toxicologist, who was called on behalf of the defendant, gave a similar opinion. The Central Public Health Committee of the London County Council, which controls the ambulance service, has made a reply stating that this opinion is not supported by medical teaching or by those who have experience of ambulance work. It maintains that a principle of first aid is that the person seriously injured should be allowed to remain in the place where he has fallen until examined by a physician or a person skilled in first aid. It is held to be dangerous to move a patient who has sustained severe head or spinal injuries before first aid has been given, and in this case a local physician who saw the patient after the first accident was of the opinion that she should not be moved. Representatives of the two ambulance organizations—the Order of St. John and the British Red Cross Society—expressed to the committee the same opinion, which is laid down in their textbooks. It is added that the number of street accidents dealt with by the council's ambulance service in 1930 was 34,529, that this method had been employed ever since the ambulance service was started, and that the present case was the first in which a second accident occurred while the patient was being treated. Therefore, notwithstanding the opinions expressed at the trial, the council will keep to the established practice, which is in accord with current medical opinion and the advice of the council's own medical officers. They consider that it would be highly dangerous to issue an instruction to the ambulance staff that the injured should not be treated where they fall.

Another Attempt of Osteopaths to Obtain Recognition

In the house of commons a labor member has introduced a bill to regulate the practice of osteopathy and to prescribe the qualifications of osteopaths. He said that recognition had already been granted in forty-seven of the states of the United States. The bill was opposed by another labor member, a physician, who argued that the proposed standard was not sufficient to guarantee the public against serious mistakes. However, the bill was read a first time. A few years ago a similar attempt was made, but the bill was defeated by a considerable majority. However, the fact was revealed that the osteopaths had a large number of supporters in the house. There is toleration in this country, unlike the continent, for all sorts of irregular practitioners, but it does not seem likely that two orders of practitioners for the treatment of all maladies will be recognized.

The London Clinic and Nursing Home

Probably no city in the world presents such a contrast in the provision for illness as London. On the one hand, there are the voluntary hospitals where the poor have at their disposal every resource of modern medicine and surgery and the services of the best specialists of the day. Nothing comparable can be obtained outside the hospitals except by the rich. There remains the great middle class, whose circumstances or whose pride remove them from the hospital class, who have to put up with makeshift accommodation and are excluded from all the advantages of equipment and coordination found in the hospitals. The advance of medical science has meant more and more elaborate equipment and greater and greater need for coordination of services and therefore has aggravated the evil. Modern specialist treatment requires a building specially adapted for the investigation and treatment of disease, organized on modern lines and provided with laboratories and x-ray equipment. After much effort, extending over twelve years, such a building containing rooms to suit all classes of paying patients is now nearing completion. The great difficulty was that there is a strong feeling against the financing of nursing homes by physicians, while no financial group was prepared to undertake a risk in which physicians refused to share. A solution agreeable to both parties was reached. A company was formed to erect a building consisting of a nursing home, for the financing of which the company would be responsible, and a number of consulting rooms, the lease of which the physicians might purchase without breach of medical ethics. This assured the company of satisfactory medical support without involving the physicians in financial responsibility for their affairs. The building is in the neighborhood of Harley Street, the consulting center of London. Special care has been taken to protect the patients against noise and vibration. The steel uprights that support the building are embedded in a system of padding, which insures complete absence of vibration. The building has been designed with great care and according to the best expert views. To obtain the latest information on modern equipment and organization, a committee visited the most modern hospitals of Europe and America, and it is claimed that the clinic will be an advance on anything in existence. A wide range of accommodation between small single rooms and private suites will meet the varying requirements of patients. A special feature is provision for maternity cases and for children. For

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the former a special floor has been specially equipped with arrangements to insure absolute quiet and privacy. The children will be accommodated in a special wing, so arranged that each child can, if necessary, be accompanied by its own family nurse, while a solarium opening directly on the south side of this wing will give every opportunity for fresh air and sunshine. The nursing staff will be so large that special nurses can be supplied at a low charge. There will be two resident medical officers. But it is part of the design that every patient can remain in touch with his own physician. In connection with the group of physicians, who occupy the consulting rooms, there is a plan of combined work, so that patients of moderate means may be saved multiple consultations, which involve so much expenditure of time and money.

Research on Prevention of Infantile Paralysis

Dr. E. Weston Hurst, of the Lister Institute of Preventive Medicine, has injected the virus of acute poliomyelitis into the horse and found that the immune bodies produced in its blood will protect monkeys inoculated with the disease. As monkeys are much more susceptible to the disease than man, it is concluded that a means of preventing the rendering of the latter immune has been discovered. Dr. James Collier, a neurologist, announced at a meeting held at St. George's Hospital that this was an epoch-making discovery.

PARIS

(From Our Regular Correspondent)

Jan. 28, 1931.

Experiments with Bacteria on Bullets

For a long time, it was thought that bullets from a revolver, and, especially, projectiles from an army rifle, could not transport infectious germs because the projectile was sterilized by the high temperature to which it was raised by the friction of the air during its transit. Infections found in wounds caused by projectiles were attributed to bits of clothing carried along by the projectile or to germs present on the skin. Dr. Piédelièvre, agrégé professor of legal medicine at the Faculté de Paris, with the collaboration of Dr. Guy, performed a series of experiments, which he reported recently before the Société de médecine légale. They used the bullets of three different types of army rifles and a browning revolver of heavy caliber. The bullets were sterilized in a flame and then covered with a coating of cultures of *Bacillus prodigiosus*. The barrel of the weapon was sterilized by first firing off a blank cartridge. The targets were packages of carded cotton wrapped in three thicknesses of paper, and then sterilized in the autoclave. Before the shooting, the outside wrapping was slit open on three sides and folded back like a shutter, and then folded down again after the shooting, before the package was transported to the laboratory. The fibers of cotton along the path of the bullet furnished regularly positive cultures after implantation in liquid or solid culture mediums. *Bacillus prodigiosus* was chosen by reason of its being innocuous. But Dr. Piédelièvre, who is planning to perform these experiments with other microbes, is convinced that proof has been furnished that projectiles may be infectious, irrespective of the length of the trajectory and their degree of heat in transit. Back of the packages of cotton were placed steel plates against which the bullets struck, and it is well known that, by the impact, heat is produced, so that the temperature reaches several hundred degrees; nevertheless the cotton adjacent to the impact was infected. Doyen pointed out, twenty years ago, that when a person fires a bullet into his head that reaches the brain, the prognosis is not especially unfavorable if the revolver and the bullet are new. The wounds are always fatal if the person with suicidal intent used a revolver that had been lying in a drawer for a long time, where the bullets had become charged with dust.

Difficulties in the Removal of Tattoo Marks

When the recent war opened, tattooing had not been practiced, for a century, except among troops stationed in Africa, who acquired the habit from the Arabians. As these troops have been composed of men compelled, as a disciplinary measure, to perform military service outside of France, and since, after completing their period of army service, many of them continued their bad practices, tattooing became a stigma of evildoers. At the same time, it furnished the police a means of identifying criminals. During the war, however, many soldiers amused themselves by getting tattooed. Most of these men, after the war, sought some means by which the tattoo marks could be removed, as they were rather ashamed when they went to the public baths or the seaside bathing beaches. Likewise, many evildoers had the same desire, in order that the means of identifying them might be removed. It is extremely difficult to remove tattoo marks. All the minute particles of lampblack, introduced with the india ink with which the needle of the tattooer is charged, have to be removed from the skin, one by one. When undertaken by skilful dermatologists—even though they may have made a specialty of such removals—it is a long and delicate process, and the final result is usually that white cicatricial spots have replaced the bluish spots of the tattooing. The best procedure is perhaps that introduced by Dr. Variot, which consists in applying a vesicatory, removing the epidermal membrane from the formed blister, and rubbing the denuded skin vigorously with a strong solution of silver nitrate. One region after another is taken up, if the tattooed area is large, for the inflammatory reaction produced is considerable. The number of persons desiring to have tattoo marks removed has given rise to a type of charlatanry. Dr. Locard, director of the police technical laboratory in Lyons, has published the results of an inquiry into the fraudulent practice by which charlatans take advantage of their clientele. One charlatan created an organization with representatives in all parts of France. He employed a lotion of secret composition in which Dr. Locard recognized the presence of phenol. The results were lamentable, but the victims, for fear of ridicule, did not complain. One, however, who had been burned, with resultant large sloughs leaving scars, brought suit. The police discovered at the office of the healer a supply of nitric acid. As a result of his inquiry, Dr. Locard demands that operations for the removal of tattoo marks be left entirely to physicians and that such operations performed by a person who is not a graduate physician be considered by the courts as illegal practice of medicine.

Opening of a Museum by Public Welfare Department of Paris

Dr. Mourier, director of the Assistance publique of Paris, has announced to the municipal council the opening of a museum in which will be exhibited many interesting things belonging to the archives of the department; some are several centuries old. The department has inherited equipment from all the ancient hospitals of the capital. Many persons formerly bequeathed their possessions, including their homes and all that they contained, to the poor; that is to say, to the hospitals and to the Assistance publique. Naturally, only articles that had some documentary, artistic or historical interest have been preserved. One will find in the museum rare pieces of furniture, paintings by old masters, religious books with costly colored prints, derived from the chapels of hospitals, and from the pharmacies, a collection of pottery of all epochs, which, from point of variety and richness, has no counterpart elsewhere. There is also a whole library of documents, acts, and the like, which were formerly piled up in storerooms but which now are available to the public for inspection and study. A fire in 1871, during the Paris insurrection, destroyed a part of this material, but what has been preserved has inestimable value. The museum will be installed in the buildings of the Pharmacie centrale des

hôpitaux, which is the former Hôtel des Miramiones, being located on the Quai de Gesvres, on the bank of the Seine, directly opposite the Notre-Dame cathedral.

The Pasteur Institute of Algeria

The Pasteur Institute of Algeria, which was created in 1910, published recently a report on its activities. During 1929, 126 missions of a scientific or technical nature were carried out, by the personnel of the institute, in the Sahara region, France, Italy and the three departments of Algeria. The institute performed nearly 10,000 medical, veterinarian or agricultural analyses; the rabies service treated 2,229 patients, 523 of whom belonged to the department of Algiers, 696 to the department of Constantine and 992 to the department of Oran, including 18 from Morocco. Besides the antirabic vaccine supplied to patients, the institute delivered 3,148,131 doses of vaccine, serums, ferments and various microbic products: 1,417,611 for medical use, 1,551,561 for veterinarian use and 178,859 for agricultural use. About 22,000 persons, mostly children, have been given quinine treatment. During the campaign of 1929, 126 inquiries or journeys were made; 24 lectures were delivered, and nearly 1,000 chemical analyses were performed.

BERLIN

(From Our Regular Correspondent)

Feb. 9, 1931.

Increase in Diphtheria in Europe

Professor Bürgers, director of the hygienic institute in Königsberg, reports in the *Deutsche medizinische Wochenschrift* that since the low ebb of diphtheria in Germany in 1923 (19,599 cases) the curve has risen to 38,604 for 1930 up to October 25. There may be said to be an epidemic incidence of diphtheria especially as there must be a large number of unannounced cases as against the reduced number of susceptible children, compared with the prewar period. The question arises as to whether this is a transient increase or the rising tide of a large wave. As to the causes of this manifestation, the range of diphtheria morbidity in other countries deserves attention. A survey reveals that, in Germany and in most other countries, the low ebb of diphtheria was recorded in 1923. From then on, there has been a distinct upward trend of the figures. In Holland, however, the figures have fluctuated; in Japan there was a distinct upswing in 1929, and in New York State the curve is downward until 1926, though 1927 shows a distinct increase.

As an important combative measure against the spread of diphtheria, Bürgers urges parents to note the first signs of throat disorder; if any children are suspected, to keep them away from other children and to summon a physician. It is equally important that the physician should make a diagnosis on the basis of the clinical observations and not wait for the results of the bacteriologic diagnosis, especially in cases in which early injection of serum is necessary. The question as to the value of prophylactic inoculation, in addition to anatoxin, and the method of immunization by anointing, whether with the Löwenstein ointment or with other preparations, merits closer attention. As such a method is likely to become more popular with the public and is less expensive than other methods, it would likely be easier to carry out, from a practical point of view. But one must never allow the idea to gain ground that any known immunization method will afford absolute protection. Only the aggregate of all combative measures will help to reduce the number of victims, which is still much too high.

Infantile Paralysis in Baden

The outbreak of infantile paralysis that occurred in Alsace in late summer, 1930, extended in some instances to the neighboring regions across the Rhine, although the morbidity was not as great as in Alsace. The most important observations in this field were made by Professor Moro, the director of the Heidelberger Universitäts-Kinderklinik. In Baden, 180 cases were notified, and it is estimated that, if the unrecognized and the abortive cases are included, the total morbidity would be three times as great. Forty-seven cases were admitted to the clinics; there was only one death. Bananas play no part in the transmission of the disease; nor can cattle, feathered animals or flies be justly incriminated (note the severe epidemic in winter in Sweden). The causative agent is probably invisible, and it is resistant to cold. Cultures kept for six years under refrigeration were still virulent. The incubation period in monkeys is from seven to ten days. The disease occurs chiefly in early childhood; 70 per cent of the cases were in children from 6 months to 5 years old. The rural population is more susceptible. Regions that are visited by an epidemic are spared the next time. After contact with the virus, immunity may be acquired by unrecognized infection. Only rarely does a patient infect a brother or a sister; in a series of seventy-one cases there was not a single instance of such infection among siblings. In outbreaks in buildings or in families, the several cases develop simultaneously; it is not a question of contagion through contact. The patient himself plays a subordinate part in the transmission. The disease appears to spread chiefly through healthy or mildly ill intermediate agents. The status lymphaticus constitutes a predisposition to the disease. Disinfection of excreta is necessary because of the theory that the disease may be spread through the drinking water, and also on account of the observation that the infection sometimes follows the river courses. The virus is present equally often in the intestine and in the nasopharynx. Ingestion infection has not, to be sure, been demonstrated. In threatened regions, intramuscular injection of adult's blood or serum; for example, 20 cc. of fresh blood from either parent, or of mixed blood from the two parents, is recommended as a simple, harmless and effective form of prophylaxis. Protection for a period of about four weeks may be expected.

Study Tour to East Africa

Prof. F. K. Kleine of the Robert Koch Institute for Infectious Diseases, in Berlin, received an invitation from the missions of the "white fathers" in former German East Africa to undertake a two-year study tour of that region. The invitation, with the aid of the Notgemeinschaft der deutschen Wissenschaft and the Zentralkomitee zur Bekämpfung der Tuberkulose, was accepted. The purpose of the tour was to extend and to supplement former observations on trypanosomiasis and to solve certain questions of theoretical importance. As Kleine reports, the present mandatory government combats the disease chiefly by removing the natives from menaced regions and settling them in healthy localities. The disease is thus kept under control and a sudden increase is scarcely to be feared. Since the discovery of Bayer 205, Kleine considers that no further progress in the treatment of trypanosomiasis has been made. Veterinary medicine, however, has attained further progress in the treatment of cattle that have become infected since Hans Schmidt succeeded in preparing a nonirritable form of antimony and potassium tartrate.

Two Thirds of Population Beneficiaries of Health Insurance

The number of persons who were holders of health insurance during the year 1929 rose to nearly 23,000,000; to this number must be added the members of families who are insured through the head of the family, which makes about as many more; thus, today, about 46,000,000 persons, or more than two thirds of the population of Germany, are the beneficiaries of health insurance. According to the records, the number of sick benefit associations has decreased still further. There were only 7,362 as compared with 7,426 the previous year. On the other hand, the number of members was increased by about 300,000. This denoted a slowing up in the increase of insured persons, the chief reason for which lies doubtless in the increased number of persons out of work. But the total receipts of the sick benefit

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associations have increased more rapidly than the membership, owing to wage increases and higher monthly dues. The average annual dues were 98.23 marks ($23) per member, or 6.1 per cent more than the previous year. The total contributions exceeded the sum of 2,000,000,000 marks (about $500,000,000). The expenditures increased in the same proportion as the receipts, and also exceeded $500,000,000. The principal item of expense was the cost of sick benefits, which amounted to 1,740,000,000 marks ($435,000,000), or 86.5 per cent of the total expenditures, 7.8 per cent more than in 1928. Also the administrative costs have risen of late years, though the percentage for 1929 was about the same as in 1928. The excess of receipts over expenditures for 1929 was about 800,000,000 marks ($200,000,000). The reserve funds have been increased, during the past three years, by about 1,500,000,000 marks ($375,000,000). It is apparent, therefore, that social health insurance in Germany is a financially sound undertaking.

Death of Professor Trendelenburg

The death of Paul Trendelenburg, professor of pharmacology and director of the Berlin Pharmacologic Institute, after a protracted illness, at the age of 46, is announced. After studying under W. Straub, he became, through the reputation of his publications, ordinarius at an early age, at first in Rostock and later in Freiburg, where he succeeded Straub when the latter accepted a call to the University of Munich. In 1927, he removed to Berlin as the successor of Heffter. His work on the prescribing of medicines passed through several editions in a short time. But, more particularly, the first volume of his work on the hormones has met with wide approval from scientists. In nobility of character he excelled, as he did in the quality of his scientific contributions. He was always ready to serve when called on in the interest of science and the practice of medicine, and he always welcomed to his institute students from foreign countries. Germany and science have lost in him a notable investigator and teacher.

ITALY

(From Our Regular Correspondent)

Jan. 15, 1931.

Annual Meeting of Orthopedic Society

At the twenty-first annual session of the Società italiana di ortopedia in Rome under the chairmanship of Prof. Dalla Vedova the first official paper, "The Surgical Treatment of Tuberculosis of the Knee," was presented by Drs. Meazzi and Fusari of Trieste. The speakers brought out that, although the surgical method has been condemned and the conservative method adopted by the majority of surgeons, in osteo-articular localizations of tuberculosis, cases of surgical intervention have not been lacking. The chief objection to the conservative methods is that they require a long time. The speakers reviewed various methods, old and new, used in the treatment of tuberculosis of the knee. Synovectomy, if performed as the sole intervention in arthritis, is an insufficient operation, which experience has long since condemned. In synovitis it has always given worse results than are secured by heliotherapy. In gonitis tuberculosa in young men, arthrectomy with arthrodesis has been recommended by Hibbs and Sever. This was formerly advised by Codivilla and confirmed by proofs of recoveries presented by Giuliani at the Congress of Surgery in 1927. This resection was said to be economical and takes account of the special conditions of the skeleton in evolution; on that account they prefer usually the typical resection. In osteartritis of the adult, one must place confidence in resection. The speakers prefer to intervene at once, instead of trying first a conservative treatment. For amputation a limited field is reserved today. Amputation should be resorted to: (1) to get rid of a focus of infection in a patient in advanced tuberculous toxemia; (2) to control a grave suppurating mixed infection, and (3) when resection has failed. They explained the modern methods of conservative surgery; among others, that of Mencière, the subcartilaginous evacuation of Vignard, the Robertson-Lavalle operation, the lateral splints of Dupuy De Frenelle. The common characteristic of all these types of intervention is the use of the bone graft. The speakers tried periarterial sympathectomy in five cases with unsatisfactory results. They consider that this method is not effective in osteo-articular tuberculosis. In closing, Drs. Mezzari and Fusari said that in synovitis the treatment should remain conservative; in pure osteitis, exeresis may arrest the disease and prevent an articular invasion; in osteartritis the therapeutic program will depend on the age of the patient. In children the treatment will be conservative; in adolescents should be applied, in selective cases, the new conservative methods; in adults, surgical treatment should at present be regarded as the rule, the operation of choice being resection. In advanced age, amputation is the only course left.

Several further communications were presented: Delitala of Venice reviewed his experience in forty-six cases of tuberculosis of the knee. In forty-two cases he practiced resection and the patients recovered with ankylosis; in four cases, amputation was necessary.

Maragliano of Genoa reported good remote results (observed after fifteen years) secured with an autoplastic bone graft in a case of coxitis. Pasquali of Bologna recited the results obtained at the Istituto ortopedico Rizzoli in the period 1899-1930, during which 156 resections were performed in 383 cases of tuberculosis of the knee. The statistics show that in tuberculosis of the knee resection is the preferred treatment in adults, whereas it is contraindicated in the child. The posture of the resected knee that presents the most advantages functionally and esthetically is that in slight flexion (about 5 degrees).

During the general discussion that followed, Calandra of Palermo spoke on sympathicectomy in the treatment of tuberculosis of the knee, which is widely employed in his institute. He contended that, when careful judgment is used in the selection of cases, sympathicectomy, combined with other modes of treatment, will accelerate recovery. He thus treated favorably thirty cases out of thirty-two.

Prosthetic Apparatus and Orthopedic Appliances

The official paper on the second topic, "Recent Progress in Prosthetic Apparatus and Orthopedic Appliances," was presented by Prof. M. Camurati of Bologna. For prosthetic apparatus of the lower limbs, the so-called European idea (the use of leather) has been abandoned, since 1915, in favor of the American plan (the use of wood). The wooden limbs are durable, are easy to apply, and render excellent service. In the final prosthetic apparatus, the weight-bearing foot must be proximate to the median plane of the body, and the superposition of the articular axes of the lower limb must be such as to assure the greatest stability to the wearer. In wooden prosthetic apparatus there are the temporary type and the permanent or esthetic type. There are many kinds of prosthesis that have great value: for example, the hospital prosthesis, in the manufacture of which little wood is used but chiefly fascia of plaster. The value of a prosthetic apparatus depends on its functional capacity, which is determined not only by its intrinsic qualities but also by the character of the patient; more especially, his mental state and the nature of the stump. The speaker described certain types of prosthesis of the inferior limb used at the Istituto Rizzoli in Bologna, 13,277 specimens of which were supplied during a period of thirteen years. As prosthesis of the upper limb, the speaker prefers, from the standpoint of practical utility, the more simple apparatus, in which one finds also the best adhesion of the appliance to the stump.

Galeazzi of Milan asked the opinion of the official speaker on hard aluminum, which has come into vogue in Germany and France. Camurati, on the basis of experience in the laboratories of the Istituto Rizzoli with other appliances made of

aluminum and hard aluminum, expressed the view that these materials do not have sufficient resistance. Galeazzi demonstrated his mechanical apparatus for the treatment of torticollis and cervical scoliosis. Forni of Bologna reported on massive autoplastic treatment in the management of pathologic fractures resulting from bone cysts. Tancredi of Rome demonstrated his personal contribution to the study of the physiopathology of the respiratory mechanics in scoliosis.

After numerous other communications, the convention adjourned, having chosen Milan as the next meeting place. Professor Galeazzi was elected president. The topics on the program will be: (1) The Present Indications for Orthopedic Treatment in the Sequels of Infantile Paralysis, and (2) Bone Cysts.

The Death of Professor Cattaneo

Prof. Cesare Cattaneo, director of the Clinica pediatrica of the University of Milan and of the Children's Hospital, died suddenly. He was president of the Società italiana di pediatria and one of the chief supporters of the idea of considering nipiology as a distinct specialty.

International Congress of Urban Hygiene

The second Congresso internationale di tecnica sanitaria e igiene urbanistica will be held at Milan, April 20-26, 1931, under the chairmanship of Prof. G. Venino, senator. The program will be divided into the following sections: (1) physiology, human pathology and microbiology in their relations to sanitary engineering; infections in the city and in the country; disinfections; (2) urban sanitary technic; hygiene of the street and of transportation facilities; protection against the noise of the street and the vibrations of houses and of industrial establishments; (3) sanitary technic of construction work; hospitals and sanatoriums; apartment houses; (4) sanitary technic and hygiene in the rural districts and in the colonies; (5) sanitary technic in the shops and laboratories; elimination of industrial refuse, and (6) sanitary legislation; creation and functioning of municipal officials in charge of the hygiene of homes and public buildings in the large cities; social provisions. An exhibit of equipment will be organized in connection with the congress.

The Red Cross During the Past Two Years

Senator Filippo Cremonesi, president of the Italian Red Cross, has published an account of the activities of that body during the years 1928 and 1929. In connection with the crusade against tuberculosis, four sanatoriums were enlarged and reorganized, and 1,889 patients were admitted in 1928 and 2,084 in 1929. Aid was given to tuberculous persons of Italian origin residing in foreign countries. In child welfare, in addition to having increased the work of numerous preventoriums, summer colonies and ambulatoriums for children, the administration of the Sanatorio di Ariocia was assumed. Likewise, the sanitary service in the rural schools of central and southern Italy was organized. During 1929, 1,837 children in the antitrachoma dispensaries were given assistance. The crusade against malaria was intensified, partly as a result of agreements reached with the general management of the public health service and with the Opera nazionale dei combattenti. By government order, all the first-aid services connected with other similar associations were absorbed by the Red Cross. The government has entrusted to the Red Cross the sanitary defense of the civil population against asphyxiating gases. The problem of the transportation of the sick and wounded was studied and solved by the adoption of a new type of auto-ambulance. The preparation and work of voluntary nurses have been improved. The number of schools for them has been increased to sixty-three. All the nurses, voluntary and professional, have been brought into one organization called "Famiglia delle infermiere," for the purpose of completing their training.

TURKEY

(From Our Regular Correspondent)

Ankara, Feb. 1, 1931.

The Certification of Specialists

In the last twenty years the faculty at Haydar Pasha and the Gülhane Hospital, which is a teaching hospital, has produced a number of specialists who have supplemented their studies by graduate work at European institutions, where they have received special certificates. While most specialists have devoted years of study to their special line, there are others who have worked at it for only a short time. The latter have increased in number, and in order to provide the public with efficient service the council of state drafted regulations, which have been adopted by the government.

Specialist certificates having been issued by institutions approved by the Turkish medical school or by the ministry of health and social assistance, or those issued by a hospital or laboratory of a foreign country, recognized by the Turkish medical faculty, are divided into three main groups, clinical, laboratory or hygiene specialist certificates. There are nine clinical specialities: internal medicine, surgery, mental and nervous diseases, diseases of the eye, nose, ear and throat, venereal and skin diseases, pediatrics, obstetrics and gynecology, and urology. There are six laboratory specialities: bacteriology, pathologic anatomy, medical chemistry, legal medicine, radiology and physical therapy. To procure a specialist certificate in one of these groups at least three years, of laboratory specialists at least two years, and of hygiene specialists a total of four years of special study are required. The four years of the hygiene specialists are spent in the study of bacteriology, parasitology and infectious disease, and in hygiene laboratories. Those occupied with bacteriology and parasitology spend three years. Time spent in study previous to the publication of this regulation is recognized. Physicians who have been permanent assistants in a hospital or laboratory, and those who before receiving their diploma have held internships at the Turkish medical faculty, may take the examination for the hygiene specialist certificate after three years, for the medical and surgical specialist certificate after two years, and for laboratory and other specialist certificates after one and a half years.

Candidates are examined at the medical school in the presence of the professors under whom they have studied and a jury of two other professors elected by a committee of the medical faculty. Examinations at other institutions approved by the ministry of health and social assistance are held by a jury to be elected from among the clinical or laboratory heads of those institutions; this jury is subject to the approval of the ministry of health. The examinations are to be theoretical and practical, the former in writing. Candidates who have procured specialist certificates in foreign countries must present themselves for examination before a jury of two professors to be elected by the faculty committee. Physicians holding a specialist certificate that has been procured in Turkey and who at the same time hold one that has been procured in a foreign country are to have the latter recognized without another examination. Specialist certificates of candidates who have spent the required time in special study at clinics or laboratories of institutions other than indicated by the medical faculty or the ministry of health are not valid unless recognized by an institution indicated by the medical faculty or the ministry of health. Candidates with certificates not recognized must spend three months in a clinic or laboratory indicated by the medical faculty or the ministry of health and then be examined before a special jury. Physicians who before the publication of these regulations have, without interruption, done specialist work at an institution and who do not possess a specialist certificate and who within one year from the publication of these regulations present themselves before a board of examiners with their certificates and diplomas, are to receive the specialist certificate without having to go in

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for another examination if their knowledge and skill have been investigated and not found wanting.

Certificates are made out either to candidates skilled in one of the medical branches and capable of directing a clinic or laboratory of that branch, or to specialists who engage in private practice. Only these two kinds of specialist certificates are made out. Physicians who do not possess the first mentioned certificate are not permitted to conduct the clinic or laboratory of a government, municipal or private institution. The ministry of health may issue to physicians whose certificates permit of private practice only (if those physicians have spent three years of uninterrupted study in their special branch) a license that will permit them to perform the specialist duties of their own clinic or laboratory. Certificates that have been issued before the date of publication of these regulations, by the medical faculty or by the clinics of the Gülhane Hospital, the graduate school for army physicians, or from recognized foreign institutions and which have been in accordance with these regulations, are valid.

CAPE TOWN

(From Our Regular Correspondent)

Jan. 29, 1931.

Hospitals Supplied with Radium

The year that has passed has seen little change in the medical profession in the Union of South Africa. The acquisition of adequate supplies of radium by the three provinces of the union, Transvaal, Natal and the Cape, has been made possible by public subscription, initiated, thanks to the support given by the lay press, by individual physicians. The department of public health declared that radium was a matter falling exclusively within the province of the hospitals with which public health, as a department, has nothing to do. Local funds were established, with the object of purchasing small quantities of the element, it being supposed, by the public, the government and the profession alike, that radium could be handled and cancer patients treated with radium by any general practitioner. Those who knew something about the matter vigorously protested against this interpretation of the situation and urged that the Australian example should be followed and that the government should purchase and control the radium. The minister of public health, Dr. Malan, who although a doctor of theology and not of medicine is sympathetic toward the profession and has on many occasions followed the hints given him in health matters, found himself unable to fall in with this suggestion, and the government has not contributed a penny toward the radium funds. These have been raised by the public, at the urge of medical men. Indeed, the publicity given to the radium campaign has shocked some of the older colleagues, who still imagine that a medical man must not give his opinion on anything appertaining to medicine, and especially to treatment, outside the privacy of the sickroom or the consulting room. A prominent colleague, who, quite rightly, had on returning from Europe given an interview to the lay press in which he had frankly detailed what was being done overseas in radium therapy, was indicted before our medical council on a charge of advertising. Fortunately, the council saw no evidence of advertising in what it deemed to be a matter of public duty and said so quite cheerfully. Medical men here are not yet educated to realizing that the public demands knowledge of certain facts and that it is as futile for the doctor to refuse to give these facts as it would be for the ignorant lay journalist to supply them second hand. All reputable daily papers in the union now have friendly medical men who advise them on medical matters, and this policy of asking the profession to give its views on matters affecting both it and the public can be heartily commended. The result of the publicity given by individual physicians to radium therapy has been that our main hospitals are now well supplied with radium and that the public has been roused to a sense of its responsibilities.

On the other hand, there has been a falling off in the interest displayed by the profession in what may be called medical politics. This is perhaps due to the fact that there is at present no urgent matter on which the profession is likely to be consulted. Old age and invalidity pensions are not on the legislative program, and the vigorous campaign planned to deal with them has been abandoned. From the published reports of the meetings of the federal council, which may be looked on as the mouthpiece of the profession, one gets the impression that nothing of really serious import has been dealt with during the year. The council established a committee on general practice, which might have been of considerable value; but the committee appears to have done nothing during the year, and to the lay public the federal council is practically unknown. The medical council, on the other hand, which is a statutory body containing several lay members, is well known and has lately published its regulations framed under the medical dental and pharmacy act. These regulations deal with the registration of medical men and students.

Poverty and Disease

The past year has been the driest and most trying year that the union has experienced since 1910. The rainfall has been phenomenally low, and many farmers have been unable to raise anything. The general depression has affected all sections of the community, but in the drought-stricken areas the medical practitioners are especially affected as they are more often called on to attend patients, sickness having increased, while their fees are never paid. In one district a physician has received no payment on account from private patients for many months; all he has had to exist on is the monthly check from the government, his honorarium as district surgeon. The ensuing poverty has reacted on the health of the people, particularly in country areas and in the poorer urban quarters, which are being thronged by vagrants emigrating from the country. Malnutrition caused by bad foodstuffs and insufficient vitamin content of the food is common. Pellagra is on the increase. Xerophthalmia, formerly rarely seen, is now common enough. Acrodynia is not uncommon, and where it occurs its prognosis here is apparently much less favorable than elsewhere. The juvenile population in the poverty-stricken districts subsist on maize meal and sweet potatoes. They suffer extensively from carbohydrate overfeeding. The native population, which lives almost exclusively on mealies, and has given up, largely, its nutritious millet meal, is badly off. The death rates among children appears to be slightly on the increase, but that, in the circumstances, is less to be regretted than is the general lowering of the standard of vital resistance, which is almost everyhere apparent. It has been repeatedly urged that the government should devote special attention to a study of the factors that militate against the health of the European and native child, but so far there does not seem to be any coordination of child welfare effort. Much energy and money are being wasted in dealing with this matter on haphazard lines.

The Law and the Quacks

The medical, dental and pharmacy act forbids any one who is not registered as a practitioner to do anything "specially appertaining" to the practice of medicine. Heretofore it has been almost impossible to prosecute a quack, of whom there are many, for South Africa is probably a dominion paradise for the faith healer, the Christian scientist and the "patent" medicine vender, and supports its own brand of the genus in the shape of the Kaffir witch doctor. Lately the supreme court at Pretoria has allowed the appeal of a quack from a magistrate's court decision. The judge declared that where the quack did something "for the purpose of humoring his victims in order to induce them to accept treatment, the price for which would vary according to the affluence of those undergoing it," it could not be said that he was doing something appertaining to the practice of medicine. This particular quack gave his victim a

confection of dates and senna, but the judge held that that was not necessarily "medicine." He told another victim that his eyes were poisoned "by injections for malaria" and charged 10 guineas for restoring his sight. The judge did not think that the sight testing was "appertaining to the practice of medicine" and said so. The judgment has given rise to some discussion, and it is felt that a test case would be desirable. At present the uncertainty as to what the words of the act really mean allows the quack practically a free hand.

UKRAINE

(From Our Regular Correspondent)

Odessa, Jan. 16, 1931.

Popularizing Cremation in Ukraine

The first crematory was opened in Moscow in 1920. It was impossible to open a crematory before the revolution, as the holy synod—the supreme ecclesiastical authority in the Russia of the czars—was opposed to it because of religious considerations. The Moscow crematory did not begin functioning until some years after it was officially opened. About 1930 the idea of building crematories in the Ukraine arose. The government has already given its sanction to the projects of crematories in Charkoff and Odessa, and in Charkoff a crematory is already being built. The price of a cremation will be about one rouble (50 cents), which includes the cost of a wooden coffin, special clothing and boots. Before the cremation takes place, the relatives may perform all the religious rites they wish. Afterward, the ashes are placed in a special urn, which the relatives of the deceased may take away with them or leave at the crematory in a columbary. The experience of the Moscow crematory shows that usually cremation is not accompanied by any religious rites; the most popular funerals are the so-called civil funerals, in which the clergy does not take any part.

The Antireligions League has organized this year a circulating exhibit with the aim of popularizing in the Ukraine the idea of cremation. This exhibit displays much interesting material and is accompanied by special lecturers, who speak on cremation. It has visited Odessa and will visit all the Ukrainian centers. A large number of persons have attended the exhibit.

The Health Resorts of Odessa

Odessa, and particularly its mud health resorts, the Koujalnik and Hadjibei "limans," occupy a prominent place among the health resorts of the Ukraine. They are situated on the shores of firths—arms of the sea separated from it by a flat elevation of the ground. As a result of evaporation due to the constant influence of the air and the sun, the water in these firths—the "rapa"—is saturated with a concentrated solution of salts, having from 4.5 to 27 Baumé degrees, and contains about 76.5 Gm. of salt in 1 liter of water.

The bottom of the firth is covered with a thick layer of mud or slime, formed as a result of the dying out of the Black Sea's ancient fauna, as well as of the rising of the sea level and of its water becoming more salty with the access of waters from the Mediterranean Sea during the glacial era. This slime consists chiefly of numerous products of the putrefaction of organic matter and bacterial bodies. The process of formation has continued until even our time, as is proved by the presence of plenty of hydrogen sulphide on the bottom of the firth. From its slimy origin the mud of the firths, liman mud, unlike the turfy mud in western Europe, is extremely plastic, oily, thick and quick to oxidate.

A long time before Odessa was founded the local population used this mud for the healing of all kinds of chronic diseases. The treatment of patients with liman mud was recognized by the medical authorities in the fifties of the last century, from which time dates the construction of the first special clinics and hospitals in Odessa. The mud and rapa are used for general and local baths, applications and gynecologic tampons. The following diseases are said to be affected by means of the liman mud: chronic and subacute arthritis, chronic gynecologic diseases and chronic and subacute inflammatory processes of the peripheral nervous system. The results of the treatment with liman mud are seen from the following items: Out of 1,000 arthritic patients 90 per cent were much improved; 40 per cent of them were able to move their joints, and 40 per cent of the patients suffering with all kinds of diseases of the peripheral nervous system got much better.

This is a matter of great importance because the number of arthritic patients is constantly increasing. According to the *Deutsche Krankenkassen Statistik* (Zimmer), the number of those patients is 8.2 times greater than that of tuberculous patients. The number of patients receiving their course of treatment on the Hadjibei and Koujalnik limans is increasing every year. In the summer of 1923 there were 1,500 patients and in 1930 there were 9,000.

Mortality in the Ukraine

The improvement in the living conditions of the Ukrainian people as a result of the October revolution led to a decrease in the mortality of the population and to the increase of childbirth. Mortality in 1928 was 36 per cent less than in 1913. This is particularly obvious in the two large industrial centers of this country. The mortality rate of 1927 as compared to that of 1910 is 57.3 per cent lower. As may be seen from the accompanying table, the child mortality has considerably decreased.

Infant Deaths in Each Thousand Births

Town	Country	1910	1927	1927 Percentage in Comparison with 1910
Union of Socialist Soviet Republics (Moscow)	Russian Socialist Federation of Soviet Republics	27.1	13.5	49.8
Union of Socialist Soviet Republics (Charkoff)	Ukrainian Socialist Soviet Republics	24.2	11.0	45.4
Union of Socialist Soviet Republics (Minsk)	Bielorus Socialist Soviet Republics	22.8	12.6	55.8
Warsaw	Poland	19.2	14.4	75.9
Riga	Latvia	17.5	14.1	80.3
Kowno	Lithuania	21.7	17.0	78.2

This table contains statistics from six large cities which were part of the former Russian empire. As may be seen, in towns of soviet Russia the child mortality has considerably diminished in comparison with the child mortality in towns of neighboring countries.

These items show that the Ukraine makes great progress as to the improvement of the health of its population. It must be also noted that there is a high birth rate in the soviet union, the natural increase of the population having risen 40.8 per cent from 1913 to 1928.

With the further growth and development of prophylactic and medical establishments, as well as with the rise of the population's cultural level, mortality in the Ukraine will diminish more and more.

Marriages

LYMAN T. MEIKS, Indianapolis, to Miss Marie Olsen of Omaha, Neb., in Chicago, February 14.

THOMAS L. BENNETT, JR., to Miss Mildred Jackson, both of Florence, Ala., February 17.

LOUIS PERLIN, Richmond, Va., to Miss Lillian Levin of Baltimore, February 15.

ARTHUR H. GRAHAM, Opelika, Ala., to Miss Henrie Elma Gholson, February 21.

R. L. ALVAREZ, Galesville, Wis., to Miss Hazel Wanlass of Sparta, February 17.

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Deaths

John Conrad Hemmeter ✦ Baltimore; University of Maryland School of Medicine, Baltimore, 1884; emeritus professor of clinical medicine at his alma mater; member and past president of the American Gastro-Enterological Association; formerly on the staffs of the Bay View Hospital and the University Hospital; author of "The Special Pathology and Treatment of Diseases of the Digestive Organs," "Diseases of the Stomach," "Diseases of the Intestines," and others; aged 67; died, February 25, of carcinoma of the stomach.

Henry Harrison Briggs ✦ Asheville, N. C.; Yale University School of Medicine, New Haven, 1897; member of the American Academy of Ophthalmology and Oto-Laryngology, American Laryngological, Rhinological and Otological Society, American Ophthalmological Society and the American College of Surgeons; chief of staff at the Mission Hospital; aged 59; died, February 6, of heart disease, while at sea on the S. S. *Duchess of Bedford*.

Charles Everett Stanley, Durham, Conn.; University of Pennsylvania School of Medicine, Philadelphia, 1876; member of the Connecticut State Medical Society and the New England Society of Psychiatry; for many years on the staff of the Connecticut State Hospital, Middletown; aged 79; died in February.

Francis Edward Victor Shore ✦ Des Moines, Iowa; University of Michigan Medical School, Ann Arbor, 1886; member of the American College of Surgeons; past president of the Polk County Medical Society; aged 67; died, February 9, in the Mercy Hospital, of arteriosclerosis.

Melbourne Edward Armstrong, Bridgetown, N. S., Canada; Medical Department of the University of the City of New York, 1892; formerly county medical health officer; for many years on the staff of the Annapolis County Asylum; aged 64; died, January 1.

Hugh Kidder, New York; New York Homeopathic Medical College and Hospital, New York, 1896; formerly instructor in clinical medicine at his alma mater; at one time on the staff of the Metropolitan Hospital; aged 61; died, February 16, in the French Hospital.

Charles John Colwell Oliver Hastings, Toronto, Ont., Canada; Victoria University Medical Department, Coburg, 1885; L.K.Q.C.P. Ireland, 1886; past president of the American Public Health Association; medical health officer; aged 71; died, January 17.

Roy Coutts, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1914; served during the World War; on the staff of the Christie Street Hospital; aged 46; was killed, February 6, when the car in which he was driving was struck by a trolley car.

William Blakeway Hanna ✦ Mass, Mich.; Hahnemann Medical College and Hospital, Chicago, 1889; past president of the Ontonagon County Medical Society; formerly county coroner and bank president; aged 67; died, February 15, of carcinoma.

Ernest Harold De Muria ✦ Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1920; aged 35; on the staffs of the Brooklyn Eye and Ear Hospital and the Brooklyn Hospital, where he died, February 19, of septicemia.

William A. Horton, Grayson, Ky.; Medical College of Ohio, Cincinnati, 1891; member of the Kentucky State Medical Association; on the staff of the Stovall Memorial Hospital; aged 64; died, February 19, of pneumonia following influenza.

Paul Fitzgerald, Maplewood, N. J.; Medical Department of Columbia College, New York, 1894; associate medical director of the Prudential Life Insurance Company; aged 62; was killed, February 21, in Newark, when struck by a trolley car.

John Christian Montgomery, Charlotte, N. C.; Medical Department of the University of the City of New York, 1891; formerly professor of anesthetics, North Carolina Medical College; aged 62; died, February 18, of heart disease.

Charles Colhoun, Rutherford, N. J.; Medical Department of Columbia College, New York, 1890; member of the Medical Society of New Jersey; for sixteen years member of the board of health of Rutherford; aged 67; died in February.

Richard B. Henderson, Franklinton, N. C.; University of Maryland School of Medicine, Baltimore, 1884; member of the Medical Society of the State of North Carolina; aged 73; died, February 19, in the Duke Hospital, Durham.

Charles A. R. Campbell, San Antonio, Texas; Medical Department of the Tulane University of Louisiana, New Orleans, 1899; member of the State Medical Association of Texas; aged 65; died, February 20, of septicemia.

Julius Jones, Rockford, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1884; member of the Medical Association of the State of Alabama; aged 72; died, February 12, of endocarditis and nephritis.

Preston Powel, Adair, Iowa; College of Physicians and Surgeons, Chicago, 1889; member of the Iowa State Medical Society; aged 63; died in February in the Iowa Methodist Hospital, Des Moines, of heart disease.

Leon George Banton ✦ Island Falls, Maine; Columbia University College of Physicians and Surgeons, New York, 1920; aged 36; died, January 22, in the Aroostook Hospital, Houlton, of ethyl chloride poisoning.

Michael Frederick Brondstetter ✦ Mount Pleasant, Mich.; University of Michigan Medical School, Ann Arbor, 1911; proprietor of a hospital bearing his name; formerly county coroner; aged 45; died, February 14.

Paul Hullhorst, Topeka, Kan.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1889; formerly lecturer on materia medica at his alma mater; aged 64; died, February 5, in the Christ Hospital.

Harry Mead Warner ✦ Hempstead, N. Y.; University of Pennsylvania School of Medicine, Philadelphia, 1898; aged 57; died, February 16, in India, during a world cruise, as the result of a fall from a train.

Lewis Broadwell Brasher, Denver; Gross Medical College, Denver, 1891; Civil War veteran; aged 86; died, January 26, in the Fitzsimons General Hospital, of chronic pulmonary tuberculosis and myocarditis.

James Rufus Gordon, Jamestown, N. C.; Baltimore Medical College, 1891; formerly member of the state legislature and of the state board of health; aged 73; died, February 20, of cerebral hemorrhage.

Mary S. Sanderson, Amherst, Mass.; University of Michigan Medical School, Ann Arbor, 1893; aged 67; physician in charge and owner of the Rangeview Sanitarium, where she died, January 10.

Charles Henry Weissberger ✦ New York; Medical Department of the University of the City of New York, 1885; on the staff of the Hospital for Joint Diseases; aged 71; died, February 16.

John M. Clarke, Burlington, Vt.; University of Vermont College of Medicine, Burlington, 1873; aged 84; died, January 17, in the Mary Fletcher Hospital, of pneumonia, following a fractured leg.

Aime Noel Leblanc, Gardner, Mass.; School of Medicine and Surgery of Montreal, 1889; for twenty-two years member of the board of health; aged 66; died, Nov. 22, 1930, of heart disease.

William Preston Copeland, Eufaula, Ala.; Bellevue Hospital Medical College, New York, 1870; member of the Medical Association of the State of Alabama; aged 85; died, February 17.

James Thomas Elliott, Denver; Ohio Medical University, Columbus, 1897; member of the Colorado State Medical Society; served during the World War; aged 61; died, February 21.

Harvey Shoemaker ✦ Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1886; chief of the medical service at the Lankenau Hospital; aged 66; died, February 2.

Robert E. B. Bledsoe, McCamey, Texas; University of Texas School of Medicine, 1898; member of the State Medical Association of Texas; aged 57; died, February 1, of heart disease.

Patrick A. Shannon, New Brunswick, N. J.; L.R.C.S., Ireland, 1874; aged 79; died, February 18, in St. Peter's Hospital, of injuries received when he was struck by an automobile.

A. Kemper Gilmer, Lebanon, Va.; Medical College of Virginia, Richmond, 1896; aged 57; died, February 18, in a hospital at Abingdon, Va., of heart disease and pneumonia.

Charles L. Reason ✦ Grafton, Ohio; Medical Department of Western Reserve University, Cleveland, 1890; aged 63; died, February 15, in the Elyria (Ohio) Clinic, of heart disease.

Hans Th. Kide Haerem, Story City, Iowa; University of Oslo, Norway, 1898; member of the Iowa State Medical Society; aged 58; died, February 15, of nephritis.

Charles Bradford McAboy ✙ Pittsburgh; University of Pennsylvania School of Medicine, Philadelphia, 1901; aged 55; died, February 5, of cerebral hemorrhage.

Alfred Benjamin Hart, Jr. ✙ Owatonna, Minn.; St. Louis University School of Medicine, 1925; aged 29; died, January 4, in the City Hospital of cerebral embolism.

Walter Alva Fletcher, Valley View, Texas; Baylor University College of Medicine, Dallas, 1927; aged 40; died, February 3, in a sanatorium at Gainesville.

Charles B. Bateman, Centralia, Ill.; Keokuk Medical College, College of Physicians and Surgeons, 1904; aged 53; died, February 8, of cerebral hemorrhage.

Alexander Augustus Cirkler, Minneapolis; University of Berlin, 1893; aged 65; died, Dec. 30, 1930, in Los Angeles, of acute lobar pneumonia and nephritis.

Samuel Wesley McDowell ✙ Pittsville, Pa.; Jefferson Medical College of Philadelphia, 1884; aged 76; died suddenly, January 30, of heart disease.

Henry Preston Clarke, Tulsa, Okla.; Memphis (Tenn.) Hospital Medical College, 1887; aged 71; died, February 15, in Geary, Okla., of heart disease.

Eri Perry Rice, Chicago; Rush Medical College, Chicago, 1889; member of the Illinois State Medical Society; aged 71; died, February 21, of pneumonia.

John Thomas Sullivan, Boston; Dartmouth Medical School, Hanover, N. H., 1893; aged 62; died, February 7, in the City Hospital, of pneumonia.

Jay R. Gould ✙ Niagara Falls, N. Y.; University of Buffalo School of Medicine, 1915; aged 38; died, February 14, in a local hospital, of pneumonia.

John Frank Laval, Evansville, Ind.; Rush Medical College, Chicago, 1919; aged 37; died, February 6, in the Deaconess Hospital, of pneumonia.

Ralph M. Jones, Denver (licensed, Colorado, 1917); aged 45; died, Dec. 28, 1930, in Los Angeles, of general peritonitis, cholecystitis and pancreatitis.

Pinckney French, St. Louis; Miami Medical College, Cincinnati, 1873; formerly bank president; aged 78; died, March 4, of cerebral hemorrhage.

Gerson Bencion Citron, New York; Baltimore University School of Medicine, 1900; aged 56; died, February 20, in the Mount Sinai Hospital.

James A. Cross, Battle Creek, Mich.; Detroit Homeopathic Medical College, 1874; aged 78; died, February 17, of cerebral hemorrhage.

John F. Runnels, Chicago; Louisville (Ky.) Medical College, 1879; aged 81; died, March 6, of mitral insufficiency and arteriosclerosis.

James Thom Hope, Alexandria, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1901; aged 56; died, January 4.

George Mackey Laing ✙ Cicero, Ill.; L. R. C. S., Ireland, 1889; aged 61; died, February 9, of wounds received when shot by bandits.

Joseph Bryant Hardy, Reno, Nev.; Marion-Sims-Beaumont Medical College, St. Louis, 1902; aged 52; died, February 19, of pneumonia.

William R. Bentley, Morristown, Ind.; Chicago Homeopathic Medical College, 1886; aged 79; died, February 16, of pneumonia.

Joseph Sutherland Graham, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1902; aged 50; died, January 6.

Joseph Evan Hall ✙ Alexandria, Ind.; Medical College of Indiana, Indianapolis, 1881; aged 72; died, February 16, of heart disease.

Philip M. Bell, Sherrodsville, Ohio; Toledo Medical College, 1899; aged 70; died suddenly, February 13, of heart disease.

Joseph Hyman Green, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1925; aged 32; died, Oct. 17, 1930.

John C. Lebrecht ✙ St. Louis; St. Louis Medical College, 1882; aged 71; died, February 23, of heart disease.

Bureau of Investigation

W. H. Y.

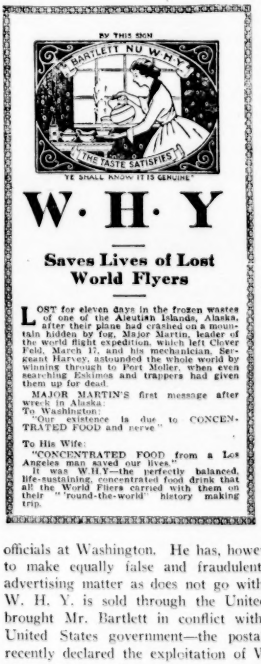
A Fraudulently Exploited Nostrum Debarred from the Mails

"W. H. Y." has been described by its exploiters as a "100 per cent pure, concentrated food beverage." It is marketed from Azusa, Cal., by the Bartlett Nu Products Corporation, a concern that was incorporated in 1920 under the laws of Arizona and having the following officers:

G. M. BARTLETT, President, Treasurer and General Manager.
V. L. MCCULLOUGH, Vice-President.
MRS. G. M. BARTLETT, Secretary.

G. M. Bartlett claims to be the "discoverer" of the formula for W. H. Y., the ingredients of which are said to be extracts of raisins, figs, walnuts, peanuts, barley, wheat and celery.

Readers of this department of THE JOURNAL may remember that on November 24, 1928, there was published an abstract of a Notice of Judgment against W. H. Y. The government, at that time, had declared that the claims on the trade package of W. H. Y., to the effect that the product aids digestion, assimilation and elimination, and that it was a health-sustaining food and that it was recommended by physicians and dietitians everywhere, and that it was "the cup of life and would feed your glands and give you strength," were false and fraudulent. These charges were admitted and judgment of condemnation and forfeiture was entered.


BY THIS SIGN
BARTLETT NU W.H.Y.
THE TASTE SATISFIES
YE SHALL KNOW IT IS GENUINE
W·H·Y
Saves Lives of Lost World Flyers
LOST for eleven days in the frozen wastes of one of the Aleutian Islands, Alaska, after their plane had crashed on a mountain hidden by fog, Major Martin, leader of the world flight expedition, which left Clover Field, March 17, and his mechanician, Sergeant Harvey, astounded the whole world by winning through to Port Moller, when even searching Eskimos and trappers had given them up for dead.
MAJOR MARTIN'S first message after wreck in Alaska:
To Washington:
"Our existence is due to CONCENTRATED FOOD and nerve."
To His Wife:
"CONCENTRATED FOOD from a Los Angeles man saved our lives."
It was W.H.Y.—the perfectly balanced, life-sustaining, concentrated food drink that all the World Fliers carried with them on their "round-the-world" history making trip.

Since then, presumably, Mr. Bartlett has been shrewd enough to remove from the trade package the fraudulent claims that brought him in contact with the food and drug officials at Washington. He has, however, apparently continued to make equally false and fraudulent claims in such of his advertising matter as does not go with the trade package. As W. H. Y. is sold through the United States mails, this has brought Mr. Bartlett in conflict with another branch of the United States government—the postal authorities, who have recently declared the exploitation of W. H. Y. fraudulent and debarred it from the mails.

The case of the Post Office Department against this humbug is described in the memorandum of the Hon. Horace J. Donnelly, Solicitor for the Post Office Department, to the Postmaster General, in which Mr. Donnelly recommended the issuance of a fraud order. From this memorandum, we learn that the Bartlett Nu Products Corporation is capitalized for five million dollars; that advertisements of the product have been carried in grocery catalogues, on billboards and in circulars and folders sent through the mails; "sucker lists" have been furnished the concern by grocers and the individuals in these lists have been circularized; the company has spent, on an average, $20,000 a year advertising this nostrum.

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Some specifically fraudulent claims are taken up in detail, thus:

Claim 1.—That W. H. Y., when prepared, ready to drink, furnished 400 calories to the teaspoonful.

The nutrition experts for the Post Office Department showed that actually the product contained from 7 to 9 calories to the teaspoonful!

Claim 2.—That W. H. Y. contained the elements required for feeding the human body and that it was rich in vitamins.

Government chemists found, as a matter of fact, that W. H. Y. contained no proteins or fats and, therefore, could not have any of the fat-soluble vitamins, A and D. Furthermore, tests made in the vitamin laboratory of the Department of Agriculture failed to disclose the presence of vitamin B. Expert testimony was produced to show that the methods of preparing W. H. Y. were such as to militate against the preservation of any vitamins that might have been present in the original ingredients.

Claim 3.—That children might be reared on W. H. Y. alone.

Mr. Donnelly's memorandum brought out the fact that it would be impossible to raise children on this preparation; that the stuff might cause severe diarrhea in many cases, and that it had no properly balanced food value.

Claim 4.—That W. H. Y. was the only food recommended by the "National Aeronautical Association" as the official food for aviators.

The government brought out that there is no such organization as the "National Aeronautical Association"!

Claim 5.—That W. H. Y. won the grand prize and gold medal award in a worldwide contest held at Limoges, France, in August, 1929.

The government proved that no medal or diploma was awarded to this concern at any fair or exhibition held at Limoges in 1929.

Claim 6.—That Baby Peggy, the motion-picture star, lived six months on W. H. Y. alone and was restored to perfect health by its use.

The government produced statements from the parents of Baby Peggy, showing that at no time was the product, W. H. Y., used by Baby Peggy.

Claim 7.—That the exploiters had arrangements with hospitals, sanitariums and doctors for distributing W. H. Y.

The government brought out the fact that when asked for names to support this claim, Bartlett gave the names of Frances B. Tyson, M.D., of Leonia, N. J., and E. R. Lambertson, M.D., of Los Angeles, Cal. Mrs. Tyson is the sister of G. M. Bartlett and, according to the Solicitor's memorandum, had promised her brother to further the sale of the product, but admitted she did not know the formula and that, as a member of the medical profession, she would not allow her name to be used in any way in endorsing it. Dr. Lambertson, according to the Solicitor's report, is not at the present time connected with the Bartlett concern but has admitted that he was, at one time, considering joining it.

Claim 8.—That Bartlett employed, in connection with the business, two registered physicians.

The names of the two physicians, as given by Bartlett, were Drs. Frances B. Tyson and E. R. Lambertson, mentioned above, neither of whom, according to the evidence, has been employed by Bartlett.

As a result of this investigation, Solicitor Donnelly declared the scheme one for obtaining money through the mails by means of false and fraudulent pretenses and recommended the issuance of a fraud order against the Bartlett Nu-Products Corporation and its officers and agents, as such. The Postmaster General issued such an order February 24, 1931.

Correspondence

ENDORSEMENT OF CREMO ANTISPIT ADVERTISING CAMPAIGN BY PUBLIC HEALTH WORKERS

To the Editor:—You or your staff have undoubtedly seen my name and the names of some other public health officials in connection with the current advertising campaign of Cremo cigars.

I regret this occurrence very much, as I am sure the other doctors also do.

When I endorsed their letter I thought that I was merely giving my opinion of the spit tipping practice and did not think they would exploit me in a nation wide publicity campaign. Had I known this was their intention I should not have endorsed the letter. I did not receive any remuneration of any kind for the endorsement. A young man living in town asked me to write an opinion of the spit tipping practice, which I did. He then said that if I would give him a sheet of my paper with letterhead, he would type it, which he did. When he brought in the letter I very carelessly signed my name without carefully reading the contents.

Understand, I am not trying to make an alibi, as, of course, I have no one to blame but myself for my unthoughtfulness and hurry. Personally I shall be on guard in the future, but I also would like to see others put on their guard, which you can do through the medium of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

This kind of advertising is dirty, to say the least, and there are many in the advertising business who stand against the soliciting of testimonials in this manner.

O. FLINT CLOUGH, M.D., Poultney, Vt.

THE GALACTOSE TOLERANCE TEST

To the Editor:—The discussion in THE JOURNAL (February 7, p. 459) between Dr. Blankenhorn of Cleveland and Dr. Loewy of London relative to the galactose tolerance test concerns a technic which we have studied for the past three years at the Jewish Hospital. Our conclusions regarding it are to appear in the *Archives of Internal Medicine*. I am in complete accord with Dr. Loewy, barring minor differences. I believe that the galactose tolerance test of Bauer stands today as our only positive means of identifying toxic hepatitis early, a condition whose identification becomes paramount in the painless (clinically obstructive) jaundice seen in persons past 30 or 40 years of age. Is it carcinoma of the head of the pancreas or silent stone in the duct or is it a so-called catarrhal jaundice? Should the patient be operated on early and spared the imminent danger of hemorrhage if operated on later? Can the patient be spared an operation in the presence of an undesirable symptom, jaundice? In helping to answer these questions the galactose tolerance test renders inestimable service. More than fifty cases of jaundice have now been studied and in no instance has the test been found wanting in separating the toxic or infectious jaundice from the obstructive and hemolytic types. One of the cases reported by us in the *Medical Clinics of North America* (January, p. 955) illustrates the points in question.

Regarding Dr. Blankenhorn's letter, may I suggest that merely quoting textbooks that have failed to give due consideration to the test does not constitute damaging evidence. It is, rather, a reflection on the textbooks.

The article by Snell, Greene and Rowntree does not mention galactose, fructose having been used in their experiments. However, in a preceding article by Greene, Snell and Walters,

they say: "We shall summarize here the theoretical basis, technic and present status of the various tests employed in this work. Detailed reports will later be made with regard to the changes observed in a series of 800 cases, comprising various states." They do not even infer in their discussion of the carbohydrate tolerance tests whether galactose was tried but say that "glucose and galactose have proved unsatisfactory for clinical use." They too, have apparently come to a "literary" conclusion that the galactose tolerance test is worthless. This is certainly not the type of evidence to be offered.

The real difficulties that have beset the galactose tolerance test are twofold. First, the physiology of the liver has not been properly considered in the evaluation of this test. The carbohydrate function of this organ is vital. Nature has accordingly provided both an adequate protection and reserve. The protective element is manifest in the extraordinary regenerative capacity of the liver cells.

The galactose test is concerned with the carbohydrate function of the liver. We cannot expect to find this function deranged in mild liver damage (adequate reserve) or in chronic liver damage (great regenerative power). These are the reasons why the galactose tolerance test is of no value in chronic liver disease and in jaundice not directly due to liver cell damage.

Should the liver cells be acutely and diffusely damaged, we should expect and do find evidence of deranged carbohydrate function. Since these types of liver damage are nearly always accompanied by jaundice, we have in this test an ideal method for identifying cases of toxic or infectious hepatitis. We have also been able to diagnose such cases of diffuse damage without jaundice by means of this test.

The second cause for the difficulties this test has encountered lies largely with the originator. Bauer first presented this test as a means of detecting cirrhosis of the liver and only later realized its significance in toxic hepatitis. Efforts have been made to utilize this test in chronic liver conditions, in which cases it has no reasonable place. In brief, a valuable test has been long left unused simply because we did not understand its limitations.

HARRY SHAY, M.D., Philadelphia.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

SKIN DISEASE CAUSED BY COLD

To the Editor:—C. N., a truck driver, aged 32, has complained for three weeks of tingling, itching sensations in the skin of the feet, knees, buttocks, hands, ears and face, when these parts become slightly cold. Relief is immediate and complete when the part is warmed. The annoyance keeps him continually confined to the house, even in the mildest winter weather. He is perfectly comfortable as long as he remains in a heated room. He had a similar attack, lasting throughout February and March, three years ago. There is a history of arthritis in the lower part of the back five years ago; otherwise he has been perfectly well all his life. Examination reveals that he is apparently healthy. The tonsils are slightly enlarged and there is an advanced pyorrhea of all the teeth. Dermatographism is pronounced. His bleeding time is normal but the coagulation time is prolonged. A tooth recently pulled bled so much that a packing was necessary several hours later to stop the hemorrhage. The hemoglobin and the red and white blood cell counts are normal; the differential count is practically normal and the urine is negative for albumin and casts. The affected parts do not show noticeable change during or after an attack. He has had 15 grains (1 Gm.) of calcium lactate three times a day for two weeks without any improvement. Could you suggest a diagnosis and treatment? Please omit name.

M.D., Iowa.

ANSWER.—The condition described appears to have certain relations to frost-bite, and, like it, must be due to disturbance in the circulation. When the skin is pale and moist, it is intolerant of chilling. As the patient under discussion is not anemic, he probably has a tendency to angiospasm, possibly on a vagotanic basis, in which dermatographism is also frequently evident. If this view of the underlying disturbance is correct, atropine sulphate in doses of from 0.5 to 1 mg., taken one, two or three times a day, ought to afford relief. The giving of calcium is also advisable, as calcium deficiency may be the cause of the vagotonia as well as of the prolonged coagulation time. To secure noticeable effect from calcium salts, however, they must be given in much larger doses than have been administered to the patient. The simplest and probably the best way is to prescribe calcium lactate, say 100 Gm., in bulk; and have the patient take a teaspoonful, stirred into a glassful of water, three times daily after meals. The peripheral circulation, especially of the hands and feet, may be improved by alternating hot and cold immersions, five seconds each, for ten or fifteen times morning and evening. One commences with water as hot as can be borne and finishes with cold water and vigorous friction. For this friction one may use for prophylactic as well as for symptomatic relief an antipruritic with hyperemic and anhydrotic tendencies, salicylic acid (1 to 2 per cent) in alcohol, which deserves first consideration for this purpose, as it is odorless and colorless. Addition of thymol and phenol (1 per cent of either or each) increases the hyperemic and antipruritic effect. The use of the lotion should be followed by liberal application of talcum powder.

TREATMENT OF IMPOTENCE

To the Editor:—A man, aged 30, married, with a premarital history of no excesses, no gonorrhea, no syphilis and good health otherwise, whose weight, blood pressure, urine, prostate and genitals are all apparently normal, is able to effect erection but loses on intromission, i. e., he has premature ejaculations. There is no fatigue syndrome, no marital sexual excess and nothing of a neurasthenic or psychasthenic syndrome. What can you advise? If you publish, please omit name, initials and city.

M.D., Kentucky.

ANSWER.—In many of these cases, although the prostate feels normal to the touch, a urethroscopic examination reveals a congestion of the prostatic urethra, especially in the region of the verumontanum. If such is the case, it is important to relieve this congestion before resorting to stimulating treatment. For this purpose the patient should receive a deep urethral instillation of weak silver nitrate solution with the Bangs sound syringe every five days. One may begin with a 1:3,000 solution and gradually increase until 1:500 is reached.

In case congestion is not found, stimulating treatment should be commenced at once. The sinusoidal faradic current of moderate rapidity and as strong as the patient can bear without any pain is suggested. One cable is connected with a rectal electrode and the other with a wet-sponge electrode applied to the perineum and the current allowed to pass for about ten minutes. The prognosis is excellent in these cases.

SYMPTOMS OF CEREBRAL SOFTENING

To the Editor:—Will you please give your opinion in regard to the following: Six weeks ago a woman in fair health, aged 73, fell in her room on arising in the morning, speechless, one side of her face drawn (left), her right arm and leg paralyzed completely, and never unconscious. Speech returned a little after a few days, but she cannot talk well. Her arm and leg are completely paralyzed. Her mind is bright and active. Please suggest the treatment and the probable prognosis. Kindly omit name and address.

M.D., New York.

ANSWER.—This patient probably has a cerebral softening due to a thrombosis of the lenticulostriate artery of the left side. The initial symptoms are usually much more severe than what one may expect from the actual destruction of the tissue. Therefore it is probable that some power in the extremities will return. There is no particular treatment that can be given. The outlook in patients of this advanced age is not very good.

ETIOLOGY OF ERUPTION IN WORKER WITH OIL

To the Editor—A man, aged 27, who works in Superkool oil, put out by D. J. Stewart of Chicago, has developed a papulovesicular rash over all his fingers. I understand that this oil has about 8 per cent of sulphur and paraffin in it, and that it is considered a high grade of oil. Could this dermatitis be due to the sulphur, which I believe it is? Please send me any information on this subject. Please omit name.

M.D., Illinois.

ANSWER.—Sulphur dermatitis is dry and scaly. The common form of oil dermatitis is papulopustular, an acne. A vesicular eruption on the hands is nearly always either a dermatitis venenata or a ringworm. If the latter, the organism may be found in the roof of a vesicle, but is not always discoverable. Frequently, ringworm is found in the macerated epithelium between the toes. If this is an oil dermatitis, it should clear up when the patient lies off, and recur when he returns to work.

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ANAPHYLACTIC URTICARIA

To the Editor:—A man, aged 22, with negative family and personal history, in good physical condition, was afflicted with "hives" between the ages of 5 and 7 and never experienced a similar reaction until last spring, when he was traveling in the eastern part of the United States. He awoke one morning to find an unsightly welt in the right supra-orbital region. The only thing he had eaten for supper the night before was a candy bar. Two weeks later a similar reaction occurred. The intervals between the appearance of the welts became less, until now there is seldom a day that the patient is without one or a combination of the following welts: above the eyes, occipital region, arms, forearms, lower extremities (including plantar surfaces), abdominal skin, back (especially the thoracolumbar region), cheeks, lips and hands. The welts begin with a feeling of flushing on the particular area, followed by a plateau-like arrangement with indurated edges which persists until the lesion begins to be absorbed. Absorption takes place in from four to twenty-four hours. Capsules of ephedrine, and subcutaneous injection of epinephrine seem to hasten the absorption. The patient has been on various diets with high restriction on various proteins and carbohydrates with no influence on the condition. There is hardly a food that does not bring on the eruptions, which vary in size from a few centimeters in diameter to ones covering the entire small of the back. Lettuce and sweet milk are the only things that do not affect him. The eruptions on the cheek are submucous and can be seen as a bubble-like lump under the mucosa. Can you suggest any procedure for determining the exciting cause, the diagnosis, the treatment and the prognosis? The condition is embarrassing to him since he is in a business which brings him into contact with many people daily.

M.D., Minnesota.

ANSWER.—This case, evidently one of severe urticaria, would have to be studied thoroughly before a diagnosis as to the cause could be made. It represents one of the most difficult types for diagnosis. Dangerous attacks can be relieved by epinephrine if given to the point of causing slight tremor of the hands. Solution of epinephrine hydrochloride in 0.25 cc. doses ought to be used and this can be repeated every five minutes until relief or tremor of the hands is produced. An epinephrine reaction, such as a heart pound, can be stopped by putting a rubber tourniquet on the arm above the site of inoculation.

The outlook depends on the cause of the trouble. A case of this sort may clear up or continue with remissions for a number of years.

CAISSON DISEASE WITH MYELITIS

To the Editor:—Dec. 22, 1930, at 2 a. m., a "sand hog" was decompressed too rapidly while leaving a caisson. The pressure was 41 pounds. I was called at 2: 30 to attend him, as he was suffering the "bends" of the abdomen and lower extremities. He was immediately placed in a hospital lock, and recompression and decompression were done according to the New York State standards. After this treatment, he was given camphorated tincture of opium and massage to give the relief which the lock did not give. At 6 a. m. the patient was resting quietly in bed. At 8 a. m., he complained of inability to move the lower extremities, but sensation was present. He was immediately replaced in the hospital lock, recompression was done to 42 pounds, and for one hour massage of the lower extremities and back was administered. During this time the patient did not experience any relief. He was decompressed in one hour and placed in a hospital. He is unable to urinate and defecate. Sensation is present, the knee jerks are hyperactive, ankle clonus is present, and the Babinski reflex is positive. I desire information regarding treatment other than catheterization, enemas and guarding against bedsores. I will appreciate an early answer; kindly omit name.

M.D., Texas.

ANSWER.—This promises to be a typical case of so-called caisson myelitis, which really is not a myelitis as it is not truly inflammatory. In this case the nitrogen bubbles that escaped from the small vessels in the cord during the rapid decompression had already done structural damage to the cord fabric before they returned to the blood during the recompression. Small areas of necrosis, perhaps with small hemorrhages, remain and will gradually be converted to fibrous tissue. In this case it appears that the pyramidal tracts have suffered the most. It is no use to do any more recompression or to apply aggressive form of treatment of any kind. The main thing is to take good care of the bladder and skin, which may mean keeping the patient on a water bed if the paralysis of the legs is complete. Small doses of iodide would be in order.

PROGNOSIS IN PERNICIOUS ANEMIA—SPINAL ANESTHESIA

To the Editor:—1. What is the probable duration of life in patients suffering with pernicious anemia apparently successfully treated by modern methods? What I want to find out is the potency of the treatment over a number of years, for example. 2. What solution do you recommend for spinal anesthesia, as on the whole most efficient and safest? Please omit name and address.

M.D., Massachusetts.

ANSWER.—1. The evidence is that patients suffering from pernicious anemia who are treated with an adequate amount of liver or a potent substitute remain indefinitely in a satisfactory state of health. The problem is not to treat the patients with liver but to treat them with enough liver or a potent substitute. It must be recognized that such complications as infection, damage to the cardiovascular system and severe injury to the liver are causes of death and, when they arise in pernicious anemia, often handicap the beneficial effect of modern treatment.

2. A solution of crystals of procaine hydrochloride dissolved in spinal fluid has been proved to be, on the whole, the most efficient and safest agent for spinal anesthesia. This agent usually produces anesthesia, whereas other local anesthetic agents fail more than occasionally. On the other hand, anesthesia may not last as long with procaine hydrochloride solution as with some other agents.

SUPRARENAL EXTRACT IN EXHAUSTIVE STATES

To the Editor:—In discussing a paper on the "Exhaustive States" given at the annual session of the American Medical Association in 1929, Dr. N. S. Davis stated that a suprarenal extract, which is effective when given orally, had recently been developed at the University of Chicago. Do you know whether this product is on the market, and, if so, where it can be obtained? Please omit name.

M.D., New York.

ANSWER.—The preparation is still in the experimental stage and is not available on the market. It is a preparation of the suprarenal cortex that is epinephrine-free. When given in considerable amounts it is effective orally, but it has a much more uniform action when given hypodermically. This preparation in certain cases increases the mechanical efficiency, raises the basal metabolic rate, and increases the combustion of sugar.

TREATMENT OF MIGRAINE

To the Editor:—A woman, aged 52, menstruating until three years ago, has paroxysmal left-sided headaches. The headaches began about fifteen years ago and seemed to appear about the menstrual periods, lasting only fifteen or twenty minutes, but occurring several times daily. They are of a throbbing type, located in the temporal parietal regions, and in the past few years have extended into the occipital and postcervical regions. Position seems to have little or no effect during the paroxysms. During the past five years she has had the headaches every day, lasting fifteen or twenty minutes and returning every three to four hours. There is no particular cardiovascular weakness; the blood pressure is 122 systolic and 72 diastolic. The urine and blood Wassermann examinations were negative. She has had no diseases since childhood, when she had malaria. There seems to be no pallor of the face during an attack, nor have I been able to distinguish any change in the fundus of the eyes. Yet there is some loss of vision of the left eye. The eyes have been examined by a competent ophthalmologist. I have given her extract of hyoscyamus, phenobarbital and amidopyrine, which have given some relief. She sleeps much better, without paroxysms at night, but the first attack is about 6 o'clock every morning. If you have some suggestions on this case I would appreciate them.

J. WENDALL MERCER, M.D., Cherokee, Okla.

ANSWER.—If there are no signs of cerebral arteriosclerosis, the type of headache described with such a long chronicity may well be considered as migrainous; but the cause of the loss of vision was not stated. It is well to keep check on the optic disks at regular intervals on a patient of this age who has almost continuous headaches. Fluidextract of cannabis in increasing drop doses sometimes is helpful in the treatment of migraine, provided the drug is increased to just below the dose necessary to produce the first signs of intoxication.

SCARLET FEVER STREPTOCOCCUS

To the Editor:—Has the micro-organism of scarlet fever been isolated? If so, what is it? Is Dick's conclusion as to the cause of scarlet fever generally admitted by the profession? If so, can throat swabs and cultures determine who is and who is not a scarlet fever germ carrier? Please omit name.

M.D., Massachusetts.

ANSWER.—It appears to be generally accepted that scarlet fever is caused by a form of streptococcus. George F. Dick and Gladys H. Dick have demonstrated definitively that scarlet fever is caused by a streptococcus which produces a specific toxin, that susceptibility to scarlet fever can be determined by the presence or absence of reaction to this toxin when injected intradermally, that susceptible persons can be protected against scarlet fever by injections of this toxin, and that a useful antiserum against scarlet fever can be obtained by immunizing horses with the toxin. On account of the difficulty of recognizing the scarlet fever streptococcus either by its form or by its growth on artificial cultures, it is not practically possible at this time to determine by swabs and cultures whether a given person is a scarlet fever carrier. The scarlet fever streptococcus can be recognized by its power to produce a specific toxin and by certain immune reactions, but these methods are rather too complicated to be applicable in practical work as the matter stands at present.

VASOMOTOR PHENOMENA WITH URTICARIA

To the Editor:—I have recently seen a condition in a child of which I am unable to find mentioned in any of my textbooks. This little girl, aged 3½ years, white, has recently passed through an attack of influenza. There was a bronchitis, acute coryza and unilateral conjunctivitis with subconjunctival hemorrhage. She is at this time convalescing from these conditions and has no fever. Two days ago there began to appear in the infra-orbital region an erythrodermia which was about the size of a fifty cent piece (30 mm. in diameter) and which spread out fan-shaped in the direction of the jaw. The redness was not attended by subjective symptoms and persisted for about five minutes, when it suddenly disappeared. About half an hour later the same condition appeared on the opposite cheek and disappeared in a like manner. This would seem to be some vasomotor disturbance and I am interested, from purely an academic standpoint, to know whether there is any explanation of the condition. Please omit name. M.D., Virginia.

ANSWER.—The vasomotor phenomenon described might have been caused by any of the forms of irritation that cause other vasomotor disturbances like urticaria. Did the child receive any serum injection during the illness, or recently? If not, drugs, intestinal toxins or reflexes from internal organs might be to blame. The depression following influenza may have lowered the threshold to irritation.

BACTERIAL FLORA OF VAGINA

To the Editor:—Recently I noticed in a slide and culture from a normal vagina the presence of a type of bacilli that have long been puzzling me. Although I have consulted at least a dozen good references, I have as yet been unable to discover just what it is. These bacilli are approximately 6 microns long by 1 micron wide. They have a tendency to form chains of from two to four bacilli in cultures. There was an abundant growth on both nutrient agar and testicular agar. Can you suggest, from these few facts, anything they could be? I undoubtedly think them to be saprophytes, as the guinea-pigs inoculated intraperitoneally with a pure culture five days ago do not show signs of illness. Two on autopsy were negative for pathologic appearances. The bacilli were recovered from both of them at the autopsy. D. BURNETT LAUDER, Oakland, Calif.

ANSWER.—It is difficult to tell from the description exactly what the organism in question is, for there are a large number of different types of bacilli in the vagina. One author lists sixteen main groups of vaginal bacilli, some of which are divided into smaller classes. An extensive article on the morphology and technic of the vaginal flora was contributed by R. Salomon to J. Halban and L. Seitz's "Biologie und Pathologie des Weibes," Berlin, Urban and Schwarzenberg **3**:1156, 1924.

HEREDITARY AND CONGENITAL DISEASE

To the Editor:—Will you please explain the difference between hereditary and congenital diseases. Can you classify syphilis as hereditary? My understanding was that hemophilia, otosclerosis and insanity were the only true hereditary diseases. One, of course, may be born with syphilis, but to call it hereditary is hard to understand. Why not congenital only, as it exists at birth or is acquired later on in life? Syphilis is not transmitted as a constitutional quality from parent to child—you have or have not the disease. Why the three diseases mentioned are hereditary is easy to understand—why others are classed so is hard to understand. M.D., Wisconsin.

ANSWER.—The terms hereditary and congenital are often used as synonymous in speaking of disease. This leads to confusion. Strictly speaking, a disease of any sort is congenital if it is present at birth, even if known to be due to prenatal infection or to unfavorable uterine environment. Only those diseases are hereditary which are due to a condition different from the normal in the actual make-up of the hereditary substance in the germ cell, egg or sperm.

In this sense syphilis is congenital but not hereditary. What is inherited in many diseases is relative susceptibility or immunity to a disease, not the disease itself.

ACTION AND USES OF SODIUM GLYCEROPHOSPHATE

To the Editor:—Will you please inform me as to the maximum amount of sodium glycerophosphate that might be taken in one dose and also the maximum amount that could be taken daily without any harmful effect? Is this drug a toxicant in any dosage and, if so, in what way is it manifested? I realize its practical value as a drug is nil. Please omit name. M.D. Michigan.

ANSWER.—Sodium glycerophosphate has been used in doses up to 10 Gm. (150 grains). Information on its toxicology seems to be lacking, but there is no doubt that in large doses and concentrated solution it will act as an irritant poison by reason of its "salt action." As our correspondent points out, the glycerophosphate propaganda was based on false premises. The "glycerophosphate radical" has no therapeutic advantage over the ordinary and more economical "phosphate."

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Philadelphia, June 8, 1931. Denver, July 23, 1931. Sec., Dr. William H. Wilder, 122 S. Michigan Ave., Chicago, Ill.

ARIZONA: Phoenix, April 7-8, 1931. Sec., Dr. H. P. Mills, 14 N. Central Ave., Phoenix, Ariz.

ARKANSAS: Little Rock, May 4, 1931. Basic Science. Sec., Mr. Louis Gebauer, 1092 Donaghey Bldg., Little Rock, Ark.

COLORADO: Denver, April 7, 1931. Dr. W. W. Williams, 224 State Capitol Bldg., Denver, Colo.

IDAHO: Boise, April 7, 1931. Comm., Mr. Emmitt Pfost, Boise, Idaho.

ILLINOIS: Chicago, April 7-9, 1931. Supt. Mr. P. B. Johnson, Springfield, Ill.

MINNESOTA: Minneapolis, Regular, April 21-23, 1931. Sec., Dr. E. J. Engberg, 524 Lowry Bldg., St. Paul, Minn. Basic Science, April 7-8, 1931. Sec., Dr. E. T. Bell, 110 Anatomy Bldg., University of Minnesota, Minneapolis, Minn.

MONTANA: Helena, April 7, 1931. Sec., Dr. S. A. Cooney, Power Block, Helena, Mont.

NEVADA: Carson City, May 4-6, 1931. Sec., Dr. Edward E. Hamer, Carson City, Nev.

NEW MEXICO: Santa Fe, April 13-14, 1931. Sec., Dr. W. T. Joyner, 20-21 First National Bank Bldg., Roswell, N. M.

RHODE ISLAND: Providence, April 2-3, 1931. Dir., Mr. L. A. Round, 319 State Office Bldg., Providence, R. I.

TENNESSEE: Memphis, March 30-31, 1931. Sec., Dr. A. B. DeLoach, Medical Arts Bldg., Memphis, Tenn.

WISCONSIN: Milwaukee, April 14, 1931. Reciprocity Applications. Sec., Dr. R. E. Flynn, 313 State Bank Bldg., La Crosse, Wis.

CLINICAL CASE STUDIES AS INSTRUMENTS IN THE TEACHING OF PUBLIC HEALTH

IRA V. HISCOCK, C.P.H.
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NEW HAVEN, CONN.

Increasing recognition of prevention as the keynote in the practice of modern medicine has stimulated interest in the nature of public health instruction in medical schools. Important advances in this field of education have been made in recent years, but there is considerable variation in different institutions in the scope of courses and in the methods of instruction. In the training of medical students at Yale, public health is considered as a fundamental point of view that should permeate the daily activities of the individual practitioner and make him an active factor in the community health program.

The department of public health at Yale is constituted as one of the basic divisions of the school of medicine. The teaching of public health is correlated, through a committee on preventive medicine, with instruction given in the first three years by other departments of the medical school, which have representatives on this standing committee. The attitude of the medical students has changed over a period of years, as a result of a new attitude on the part of the whole faculty of the school. It is fair to say that every department, from pathology to pediatrics, is teaching preventive medicine.

The department of public health gives a course in principles of public health in the first half of the second clinical year that summarizes the main problems involved. This course consists of lectures, discussions in small groups, and field work. The course includes facts about water supply, waste disposal and ventilation that the average physician should know, but its chief aim is to review all the student has learned in the three years of his relations to the community and to show him the part that he, as a physician, must be prepared to play in campaigns concerning child hygiene, tuberculosis, venereal disease and mental hygiene.

Practical field work and demonstrations to illustrate the underlying principles of public health are essential features of the instruction of medical students. Until two years ago, field work at Yale, as in many other medical schools, included a health survey of a city or town. The value of sanitary surveys depends largely on the care given to the collection and analysis of data. If properly supervised and supported, they may benefit

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communities and students alike; but if performed in a haphazard or perfunctory manner, they are both time-consuming and worthless from an educational standpoint.

ORIGIN AND PURPOSE OF CASE STUDIES

The medical student enters the wards in his first clinical year and is beginning his dispensary work in his second clinical year. He finds this work more fascinating than making a health survey of the usual type, which he is inclined to regard as outside his realm and so much time taken from what he is likely at this period to consider his real medical activities. The clinical case study plan herein described was devised to take the place of the conventional health survey previously required. Through this means, the student approaches the community health program from the inside, through a personal medical contact with the individual case, working out from this concrete experience, rather than from the outside abstract approach through governmental and voluntary organizations. Attention is therefore primarily devoted to the importance of considering the relationships of a medical case to the home, the family and the community. Particular emphasis is given to the public health and social machinery that is available or that ought to be available for the prevention and alleviation of disease.

For two years, clinical departments in the medical school have cooperated with public health in the organization of a series of studies, by students in the second clinical year, of selected cases from the dispensary and hospital services. The purpose of these studies is to give the medical student a clearer conception of the varied factors underlying the immediate acute condition of illness or incapacity, seen in the dispensary or hospital, and especially to provide opportunity to consider the causes operative in a case and the methods by which the illness might have been prevented. Such a plan includes a study of community resources for handling various types of problems, medical, nursing, clinical, social service and the like, all parts of the broad problem of public health.

SELECTION OF CASES

The following types of cases were selected:

Amebic dysentery.
Gonorrhea.
Meningococcus meningitis.
Pneumonia.
Rheumatic fever.
Scarlet fever.
Syphilis, including congenital.
Tuberculosis, adult and childhood.
Whooping cough.
Industrial accidents and diseases.
Heart disease, adult and childhood.
Orthopedic cases.
Special surgical cases.
Prenatal and obstetric cases.
Mental hygiene cases.

The student was first given an opportunity to express his preference as to the type of case he would follow. Some had seen patients in the dispensary or hospital in which they had become interested. The cases so suggested were discussed with the physician in charge of the clinic to be sure that this type of study on a given case was practical. Ultimately each student was assigned one case for follow up.

PROCEDURE

After the cases were assigned, the students conferred with the physician in charge of the clinic concerned and went over the case record in the dispensary or hospital, noting at that time what service the patient had received and what other community agencies were involved.

To gain a first-hand impression of home and family conditions, from one to five home visits were made on each family. The families in most cases were responsive and gave the students more information regarding family histories and problems than had heretofore been noted. Information was obtained regarding living and working conditions, the size of the income in relation to the size of the family, histories of previous illnesses in the family, and agencies known by the family as having rendered service.

After the home visit, students interviewed heads of the nursing, mental hygiene or social service agencies carrying the cases to obtain their points of view. When the visiting nurse association was concerned, the nurse of the district in charge of the patient was interviewed. The organization and work of the most important agencies were studied. The student considered the problem of prevention, what legislation existed or should have existed that could minimize the likelihood of the disease or accident in question, and what steps the board of health, the employer, the dispensary, the visiting nurse association or the mental hygiene society had taken, or might have taken, to prevent it. In other words, he was asked to work from the condition of the individual disease back to its underlying causes and out to the entire community machinery for prevention and treatment as applied to the disease in question.

A detailed report of the case was finally prepared for presentation in class conference. As a guide in the preliminary study of the problem, each student was given the following outline of factors to be considered, but emphasis was placed on the importance of using initiative in working up the case.

FACTORS TO CONSIDER IN THE FOLLOW-UP OF CLINICAL CASES

I. The patient:
   (*a*) Description of individual and of case.
   (*b*) Immediate cause of dispensary visit.
   (*c*) Underlying causes, discovered either in the dispensary or on home visit, which have an important bearing on the production of the medical or surgical complaint.
   (*d*) Other related factors in present or past social history.
   (*e*) Response to advice and treatment in dispensary or hospital. If response is not good, why? What are the underlying causes?
   (*f*) Has medical advice been sought previously outside the clinic? From physician? Other? Use of "patent" medicines?

II. The family:
   (*a*) Description and social history. Social tendencies of mother and father.
   (*b*) Special health, medical or social problems.
   (*c*) Contacts with dispensary or hospitals.
   (*d*) Factors related to case study—financial status, etc.

III. The home and surroundings:
   (*a*) Description, general appearance, light, heat, yard, milk supply, food supply, surroundings.
   (*b*) Reasons for present home circumstances.

IV. The community:
   (*a*) Social or health agencies concerned over period of years.
   (*b*) Services rendered—adequacy.
   (*c*) Attitude of family toward agencies.
   (*d*) Possibilities of other services needed.
   (*e*) Has the community handled the problem properly? Are there any suggestions for a more scientific treatment of this case from a medical or social point of view?

V. Summary:
   (*a*) How could the medical, mental or surgical condition have been prevented?
   (*b*) How can conditions be improved?
   (*c*) Specific recommendations regarding this case.
   (*d*) Specific recommendations regarding this type of follow-up study in the future.

VI. List of persons and agencies interviewed regarding the case.

PRESENTATION OF REPORTS

The series of reports was arranged so that similar problems were presented at the same period. Two fifty-minute periods,

previously used for group conferences and field trips, were set aside for this purpose. The city health officer, the director of the visiting nurse association, and the director of the dispensary were invited to attend all the sessions. When tuberculosis cases were reported, the head of the tuberculosis clinic and hospital service, the director of the city tuberculosis bureau and representatives of community social agencies were also present. In the same manner, representatives of clinics and of nursing and social agencies were invited to be present at the sessions when cases in their fields were presented in order to participate in the discussion, to supplement the reports, to answer questions and to consider the problems from the standpoint of what might have been done, as well as what might be the developments of the future. The members of the class participated actively in the discussion. The executive secretary of the community chest was helpful on special occasions as a social service consultant, since he is thoroughly acquainted with local and state conditions and with the broad problem of social service.

In the future, it is planned to clear each case at the outset through the social service exchange and, during the three months in the fall and winter when the cases are being followed, to receive reports of new contacts with each family as additional aids to the students. This procedure is considered desirable in spite of the fact that the dispensary records show the agencies at work on the case at the time the study is undertaken.

Among the questions usually asked after a case was reported were the following: How could this condition have been prevented? After the condition developed, were the proper steps taken for its detection and amelioration? What can be done about the situation at present? How far are the community resources adequate to meet situations of this kind?

Many of the cases raised legal, social, mental, medical, nursing and public health questions. The students studied their cases intelligently and industriously and their reports were carefully prepared. In fact, some of the reports have formed the bases of clinical lectures and may be used for community case conferences by social agencies.

VALUE OF CASE STUDIES

The students become impressed with the fact that frequently the condition of a patient who comes for medical advice or treatment is only an end-result of some earlier symptom or condition. In many cases the condition that prompted a patient to come to the clinic is not nearly as serious as some other problem of the patient or his family that may be disclosed subsequently. Often the problem calls for more than medical treatment, nursing care or social service, requiring a combination of all. A new type of technic is necessary which reaches even beyond medical social service.

In the children's tuberculosis clinic of the dispensary, there are found children with tuberculosis from outlying towns in which a milk supply is suspected. The local health officer must be approached, the dairy inspected, the herd tuberculin tested. Or in a family in which there is an adult with tuberculosis, contacts may be found who have not been examined and in whom additional stimulus is necessary to bring about the necessary visits to the clinic. In visiting a medical case, one may find several children who show marked signs of rickets or malnutrition or some other defect, and the parents are urged to bring the children to the clinic. The student may arrange to meet the family at the time of the next visit to the clinic and thereby establish closer working relationships and better understanding.

Certain diseases or disabilities may suggest association with abnormal living or working conditions that need an investigation into housing problems or industrial hazards. Others lead directly back to epidemiologic factors that might have been controlled by more adequate community machinery or closer working relationships. In the field of mental hygiene, problems of the courts and of various social agencies in dealing with emotional and psychologic factors are revealed. Other studies bring one face to face with economic and social problems, and with problems of eugenics that need careful consideration.

These studies have proved of direct value to the clinics, to the students and to the patients. Fundamental prevention was emphasized and vital contact was made between the patient in the dispensary or hospital and the preventive and ameliorative machinery of the community. At the conclusion of an annual series of case reports, the students have become familiar with the community health and welfare resources and with problems of human relations. Through the breadth of view and the vital human sympathies aroused, it is believed that the students will approach patients in their private practice more constructively and humanely and that they will participate far more effectively and sympathetically in the public health programs of the community as a result of this experience.

310 Cedar Street.

Minnesota October Examination

Dr. E. J. Engberg, secretary of the Board of Medical Examiners of Minnesota, reports the oral, written and practical examination held at Minneapolis, Oct. 21-23, 1930. The examination covered 11 subjects and included 60 questions. An average of 75 per cent was required to pass. Forty-seven candidates were examined and passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Loyola University School of Medicine		(1930)	94.5
Northwestern University Medical School		(1930)	86,* 90.4, 92.1
Rush Medical College		(1930)	88.3
University of Illinois College of Medicine		(1930)	90.4
Indiana University School of Medicine		(1927)	89.6
State University of Iowa College of Medicine		(1928) (1929)	89.4, 94.5 91.5,
University of Louisville School of Medicine		(1928)	93.2
University of Maryland School of Medicine		(1929)	92.1
Harvard University Medical School		(1929)	92
University of Michigan Medical School		(1928)	91.3
University of Minnesota Medical School		(1928) (1929) (1930)	89.2, 91.2, 82.6,* 84,* 85.6, 86,* 86.5, 86.5,* 87,* 87.2,* 87.3,* 87.5, 88,* 88.2, 88.3,* 88.6,* 89.5,* 90,* 90, 90.3,* 90.3, 90.4, 90.6, 93.5
Washington University School of Medicine		(1929)	86.2
Columbia University College of Phys. and Surgs.		(1928)	90.2
University of Cincinnati College of Medicine		(1929)	86
Western Reserve University School of Medicine		(1929)	90.5
University of Oregon Medical School		(1929)	93.3
Jefferson Medical College		(1929)	92.3
University of Pennsylvania School of Med.		(1928)	87.6, (1929) 89.1
University of Virginia Department of Medicine		(1928)	91

Dr. Engberg also reports 6 physicians licensed through reciprocity with other states and 5 by the endorsement of credentials at the same meeting. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Stanford University School of Medicine		(1930)	California
Rush Medical College		(1928)	Illinois
University of Louisville School of Medicine		(1929)	Kentucky
St. Louis University School of Medicine		(1928)	Michigan
Creighton University School of Medicine		(1929)	Nebraska
University of Wisconsin Medical School		(1928)	Wisconsin

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement of
Northwestern University Medical School		(1930, 2)	N. B. M. Ex.
University of Michigan Medical School		(1928)	N. B. M. Ex.
University of Minnesota Medical School		(1929)	N. B. M. Ex.
Columbia University College of Phys. and Surgs.		(1926)	N. B. M. Ex.

* These applicants have received their M.B. degrees and will receive their M.D. degrees on completion of one year's internship in a hospital.

Kansas December Examination

Dr. C. H. Ewing, secretary of the Kansas State Board of Medical Registration and Examination, reports the written examination held at Topeka, Dec. 9-10, 1930. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Thirteen candidates were examined and passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Howard University School of Medicine		(1930)	86.8, 87.1, 88.8, 89.4
Rush Medical College		(1928)	93.0, 93.1
University of Kansas School of Medicine		(1930)	81.4, 91.7
Kansas City Hahnemann Medical College		(1912)	83.8
Creighton University School of Medicine		(1930)	90.2, 90.3, 91.6
University of Oklahoma School of Medicine		(1930)	92.4

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Dr. Ewing also reports 18 physicians licensed through reciprocity with other states at the same meeting. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1929)	Colorado
American Medical Missionary College		(1905)	Nebraska
Rush Medical College		(1928)	California, (1929, 3) Colorado
State University of Iowa College of Medicine		(1926)	Iowa
University of Louisville School of Medicine		(1925)	Kentucky
Tulane University of Louisiana School of Medicine (1924) Louisiana		(1916)	Mississippi
University Medical College of Kansas City		(1895)	(1913) Missouri
Washington University School of Medicine		(1928)	(1929) Missouri
University of Nebraska College of Medicine		(1926)	Nebraska
Eclectic Medical College, Cincinnati		(1927)	Georgia
Jefferson Med. Coll. of Philadelphia		(1912)	Montana, (1927) Texas

Book Notices

THE PATHOLOGY OF INTERNAL DISEASES. By William Boyd, M.D., M.R.C.P., F.R.S.C., Professor of Pathology in the University of Manitoba. Cloth. Price, $10. Pp. 888, with 298 illustrations. Philadelphia: Lea & Febiger, 1931.

This is a companion piece to the author's Surgical Pathology. The two volumes look alike, although published by different firms. A few borderline diseases are described in both volumes, an overlapping that is probably unavoidable and perhaps desirable. Many of the illustrations in Surgical Pathology are also in this new work. The author states that he has not confined himself to the strict limits of morbid anatomy but has allowed himself to wander rather freely in the realms of pathologic physiology. This attempt to correlate symptoms with lesions is the most distinctive feature of the treatise and receives due emphasis in the charming foreword by Barker, accompanying the preface. It is altogether natural to find this later work written in a more agreeable style than the earlier one. There is something of lure and camaraderie in the way the reader is led on by such expressions as "we have just seen," "when we consider," and "these facts justify us." On the other hand, "it is seen that," "it appears," "it becomes evident" and numerous other similar beginnings are tedious. "In one case on which I performed an autopsy" (p. 698) and the "case which was tapped 301 times" (p. 339) are disturbing, to say the least. The beaten path is left for a frolic now and then when we accompany him "steering a careful course between the Scylla of an unwarranted particularization and the Charybdis of a speculative nihilism" (p. 795). The Scylla and Charybdis of lymphoid tissues are also dangers for the tubercle bacillus (p. 197). Should it succeed in passing these, "it sets out upon an Odyssey which may carry it far and wide throughout the body."

On the whole, Professor Boyd's assurance has endowed his phraseology with literary power and some brilliance. His descriptions of disease impart a feeling of security and confidence in the information set forth. He says, for example, in discussing tabes dorsalis, "my information is not first hand," and, in another place, "it would be possible to write at great length on the subject of eclampsia but nothing would be gained thereby." Many will endorse his opinion that "the term nephrosis is responsible for much confusion and loose thinking" and this will apply equally well to the recently proposed "myocardosis" if its use becomes general. The familiar "fibrosis" lacks precise significance and it is safe to assume that few will be able to anticipate from the heading "Hydrohepatosis" on page 336 the content of the paragraph that follows. It is refreshing to find, introducing the discussion of the reticuloendothelial system, that "it is invoked to explain all kinds of enigmas and has been considerably overworked in this respect." Frequently one encounters sentences fairly gorgeous with significance. In discussing certain cells in the spleen, they are "entrapped in the pathless forest of the pulp." Again (p. 442) "There is no more perplexing subject in pathology, none more baffling and tantalizing, than the relationship between arterial and renal disease."

The plan is that which is generally followed in textbooks on special pathology or the morbid anatomy of the viscera, starting with the heart and blood vessels and ending with the central nervous system. The last chapter is twice as long as any of the others except that on the lungs. Diseases of the skin, joints, genital and lower urinary organs, apparently all without the scope of internal diseases, are omitted; those of the bone marrow have a short chapter. The rather even level of excellence makes it difficult to choose portions for especial commendation. However, among other subjects, diseases of the blood and of the thyroid gland, and pulmonary tuberculosis are discussed in an admirable and forceful manner, and with thoughtful attention to recent developments. The pages (427-437) devoted to the relation of symptoms of Bright's disease to its morbid anatomy may be recommended as a sample, should one be desired, to bring about prolonged examination of the entire volume. Throughout the book there is evidence of wide acquaintance with medical history and important contributions to knowledge of disease. Requisite compactness has been attained by limiting the text to essentials and wise selection of references for the short bibliographies at the end of the chapters. The author is to be congratulated on his success in linking up the pathology so commonly segregated to instructors and student days with the routine practice of medicine.

ANALYTICAL REVIEW OF REPORTS FROM PASTEUR INSTITUTES ON THE RESULTS OF ANTI-RABIES TREATMENT. By Lt. Col. A. G. McKendrick, I.M.S., Director of the Laboratory of the Royal College of Physicians, Edinburgh. Health Organization, League of Nations, III. Health, 1930. III. 2. C. H. 844. Paper. Pp. 158. Geneva: League of Nations, 1930.

The International Rabies Conference, which was convened by the Health Organization of the League of Nations in 1927, adopted the resolution asking antirabies institutes of all countries to submit the results of antirabies treatment on a uniform plan. Statistics of 31,636 persons treated at 31 antirabies institutes have been analyzed. They are subdivided into two groups, the European and the non-European, with the results that the non-European group appears to be at a higher state of risk than the European and that there is no indication in favor of any one of the many methods of treatment used. Particularly there is no indication favoring the use of live rather than killed vaccines. The variation in the death rates among the various European institutes is not greater than would be expected as the result of chance variation. The same is true of the non-European group. A comparison of the death rates for the two groups, however, shows that the incidence of death due to rabies is higher in the non-European group. The data are based on a small proportion of all the institutes of the world. It is expected that more definite conclusions can be reached as the scope of this analysis increases.

PHARMACEUTICAL MATHEMATICS. By Edward Spease, Ph.C., B.S., Professor of Pharmacy and Dean of the School of Pharmacy, Western Reserve University. Cloth. Price, $1.75. Pp. 126. New York: McGraw-Hill Book Company, Inc., 1930.

This little book covers the ordinary problems dealt with in pharmacy. Even physicians who may be rusty on matters of specific gravity, on percentage solutions and on the uses of tables will find items of help. The book is not in any sense profound; in fact, the term mathematics is almost too dignified. It is essentially an application of ordinary arithmetic to pharmaceutic problems.

THÉRAPEUTIQUE MÉDICALE. II: ALIMENTS MÉDICAMENTS. Par MM. M. Loeper, Marcel Labbé et al. Paper. Price, 45 francs. Pp. 328, with illustrations. Paris: Masson & Cie, 1930.

This French book on the medicinal uses of foods deserves more than passing notice, as it contains quite an array of ideas and data not generally found in the literature in this country. Thus, Loeper, in an introductory chapter, proposes the term vitines for what we call vitamins because he believes that our present knowledge of these bodies requires their subdivision into two classes: the fat soluble bodies, which should be called vitastérines, embracing A, D and E; and the water soluble or true vitamins B, C, the antipellagrous body and at least two "cellular nutrition" bodies. Richet, in a chapter on zomotherapy (from the Greek *zomos*, bouillon) relates his observations on the therapeutic value of raw meat juice on tuberculous dogs and human beings. He has elaborated a powder obtained by drying meat juice at a low temperature which produced, in his hands, remarkable effects in early cases of human tuberculosis, when taken in sufficient quantity. Doses of from 80 to 120 Gm. a day are generally well borne excepting in cases of peritoneal and intestinal tuberculosis, in which diarrhea is liable to interfere. He proposes the unfortunate name zomine for this powder,

objectionable because the ending ine should be reserved for pure active principles. Maurice Renaud deprecates the prescribing of milk *en bloc*. One should vary the composition according to the requirements of the patient and not give the same milk preparation to a baby, a senile person, a dyspeptic and a uremic patient. He brings out particularly well the eliminative value of whey. The chapters on the nutritive and therapeutic value of wine, by M. Loeper and J. Alquier, and of beer, by Raoul Lecoq, will cheer the heart of the professional "wet." It is necessary to pass, for lack of space, masterly lectures on vegetable "cures" by Henri Labbé and on fruit "cures" by Henri Leclerc; but especial attention should be given to the chapter on the therapeutics of sugar, by Noel Fiessinger, who advocates sugar as a medicament in hyperchlorhydria and gastric ulcer on the basis of the fact that it depresses gastric secretion. He also maintains that in certain persons highly sugared foods are retained and digested when in others this would be impossible, and that for this reason sugar is an important remedy in the treatment of vomiting. He quotes Loeper and Marshal as ascribing an antianaphylactic effect to sugar, on the basis of the observation in a number of cases, in which fish bouillon produced an eruption that could be prevented by the addition of sugar, or in which sugared egg was tolerated by a person anaphylactically intolerant of egg. They ascribe this effect to the leukocytosis produced by sugar. A sedative action on the opening of the ampulla of Vater is also claimed for sugar, so that egg with sugar may not produce the biliary colic that would be caused by egg without it. He admits, however, that there are dyspeptic patients who cannot take sugar without a hyperacidity reaction, which he considers due to an abnormal sensitiveness of the gastric mucosa. The necessity for the availability of sugar in immunity reactions leads him to the statement that in infectious diseases and intoxication the hydrocarbons form the basis of the therapeutic edifice. Good chapters on sea salt, cod liver oil and irradiated foods close this inspiring book.

THE TREATMENT OF HUMAN TRYPANOSOMIASIS WITH TRYPARSAMIDE: A CRITICAL REVIEW. By Louise Pearce, M.D. Monographs of the Rockefeller Institute for Medical Research, No. 23. Paper. Price, $2. Pp. 339. New York: Rockefeller Institute for Medical Research, 1930.

Here is a thorough digest of the treatment of human trypanosomiasis with tryparsamide. The author was closely identified with this work long before the introduction of tryparsamide to the medical profession. The work with this preparation has been done in a highly scientific manner. This monograph attests to the care with which Dr. Pearce has pursued her studies. Eight years has elapsed since the tryparsamide treatment of African sleeping sickness was instituted in the Belgian Congo. As the author points out, in the intervening years the use of the drug has constantly increased throughout tropical Africa where trypanosomiasis occurs, and considerable literature has accumulated on the subject. The monograph includes a review of the available records of cases that bear on tryparsamide therapy, the total number of cases considered being 1,848. From her critical analysis of the data Dr. Pearce concludes that tryparsamide is an efficacious drug for the treatment of trypanosomiasis caused by *Trypanosoma gambiense* and that it is to be recommended for general use under the conditions of both lazaret and field administration. For those interested in the treatment of human trypanosomiasis, the monograph will be found not only of interest but of real service.

PIELOGRAFIA ASCENDENTE E PIELOGRAFIA DISCENDENTE CON SPECIALE RIGUARDO ALLA NEFROPIELOURETEROGRAFIA PER VIA ENDOVENOSA. Di Prof. Carlo Ravasini, Primario del Reparto Urologico, "G. Nicolich" dell'Ospedale Regina Elena di Trieste. Paper. Price, 45 lire. Pp. 282, with 76 illustrations. Bologna: L. Cappelli, 1931.

The work is divided into two parts, the first considering the subject in general and the second presenting numerous illustrations of intravenous pyelography in almost all disturbances of the kidney, including such rare lesions as echinococcus cyst. The initial portion of the monograph outlines the principles, technic and limitations of ascending pyelography based on 200 selected cases. It then describes the history of the development of descending pyelography, the early use of iodized urea and the peroral method of Ziegler and Köhler. Iopax is minutely described as to its history, chemical and physical properties, toxicity, antiseptic action, technic of administration, indications and contraindications, and tolerance. A chapter describes the methods of using intravenous pyelography by iopax for the evaluation of renal function. Finally, ascending and descending pyelography are compared, the advantages and indications for the two methods being thoroughly considered. Ravasini is enthusiastic over the results obtained by the intravenous method.

UNTERSUCHUNGEN ÜBER DIE HARNSTEINE. Von S. Ōkawa. Monographiae Actorum Dermatologicorum. C. Series Urologica. No. 2. Paper. Pp. 52. Kyoto: Instit. Dermatosyphil., Universitas Imperialis, 1929.

The author examined 177 urinary calculi, which were obtained from 94 patients. The stones were examined chemically with especial reference to the quantitative values of the various urinary salts. Many stones were analyzed, after division into central, middle and outer layers; others were cut into sections from 0.2 to 0.02 mm. in thickness and studied microscopically. Various types present different important characteristics, particularly in regard to their surface, the size of the component crystals, and other interesting features of chemical interest.

THE ELECTROCARDIOGRAM. By W. H. Craib. Medical Research Council, Special Report Series, No. 147. Paper. Price, 1s 3d. Pp. 57, with illustrations. London: His Majesty's Stationery Office, 1930.

This monograph is a valuable contribution, especially helpful to those who wish to understand the principles underlying the production and interpretation of the electrocardiogram. It may not interest the average practitioner as it is highly technical, dealing with many questions of physics, especially with electricity, as they concern the physiology of the heart. It is a most creditable piece of investigation and is admirably presented.

CRITICAL STUDIES IN THE LEGAL CHEMISTRY OF FOODS FOR CHEMISTS, FOOD INSPECTION OFFICIALS AND MANUFACTURERS AND DEALERS IN FOOD PRODUCTS. By R. O. Brooks, B.Sc., Consulting Food Inspection Chemist. Cloth. Price, $6. Pp. 280. New York: Chemical Catalog Company, Inc., 1927.

This is largely a compilation of information on the legal aspects of the chemistry of some of the important classes of foods. The articles have been previously published by the author in various technical and trade journals. The book is written in simple language understandable to the intelligent layman. The significance of compiled chemical facts and data for foods with respect to food laws, regulations and standards is considered. Analytic data little known to the average chemist and layman are drawn from various chemical journals, federal, state and Canadian food inspection reports, and reports of the U. S. Bureau of Chemistry and the Connecticut State Experiment Station. Chapters are devoted to the legal chemistry of fruits and fruit products, vinegars, interpretation of a vinegar analysis, legal chemistry of some condimental sauces, edible oils, cacao products, spices and maple products. The appendix furnishes some miscellaneous information on standards and definitions for fruit and fruit products, how carbonated fruit beverages are made, investigation of methods of preparing carbonated beverages from fruits, requirements of pectin for the commercial jelly makers, the importance of sugar in determining texture, flavor and yield of jelly, research on the manufacture of mayonnaise, report on a cooperative research on mayonnaise, and the labeling of beverages and beverage materials under the federal Food and Drugs Act. The book is especially serviceable as an aid to the detection of adulteration of the foods discussed, for the interpretation of analyses in problems dealing with food laws, and for correlation of chemical composition, food inspection decisions and food standards. Much valuable information and data are made readily available in the discussions and tables. The meaning of the various chemical determinations used in food analysis is well considered. The book should serve as an excellent guide and aid in the ordinary problems involving commercial foods, their chemical composition and their legal status under the food laws.

DIE FILTRIERBAREN KRANKHEITSERREGER UND NEUES ZUM TUBERKULOSEPROBLEM: GEDANKEN ZUR VERERBUNGSWISSENSCHAFT AUF GRUND VON STUDIEN AN DER LAHMKRANKHEIT (RENGUERA) DER HAUSTIERE IN PERU. Von Dr. Med. Vet. Fritz Mrowka, Veterinär-Institut der Hacienda Casa Grande in Perú. Paper. Price, 15 marks. Pp. 208, with 114 illustrations. Leipzig: Johann Ambrosius Barth, 1931.

This is an interesting but highly speculative thesis tracing certain diseases, including several produced by filtrable viruses, to lipoprotein intoxication and autonomous development of the specific causative micro-organisms from fat droplets.

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Medicolegal

Liability of Third Person for Medical Fees

(Swarens v. Pfnisel (Mo.), 26 S. W. (2d) 951)

Pfnisel was burned in a gasoline explosion in the course of his employment. His cousin, Mrs. Amel, with whom he boarded, requested Dr. Swarens to render medical services and promised to pay his bill. Pfnisel was unconscious when Swarens first visited him and at no time said anything to Swarens about employing him. Swarens, however, did not charge Mrs. Amel on his books for his services; he made the charge to Pfnisel. He rendered no bill to Mrs. Amel, but when his services ended, he, at Mrs. Amel's request, delivered his bill, made out against Pfnisel, to Pfnisel's attorney, who was negotiating for a settlement with the insurance company by which Pfnisel's employer was insured. Swarens' bill was not paid, so he sued Pfnisel and Mrs. Amel jointly. Judgment was rendered against both of them, but Mrs. Amel appealed, ultimately carrying the case to the Supreme Court of Missouri, Division No. 2.

Mrs. Amel contended that her promise to pay Swarens for his services was void, because it was not in writing, since the statute of frauds provides that "no action shall be brought to charge . . . any person upon any special promise to answer for the debt, default or miscarriage of another person" unless the agreement is in writing. Her contention, said the Supreme Court, was well taken, citing *Price* v. *Chicago, M. & St. P. Rd. Co.*, 40 Mo. App. 189, to show that if the beneficiary under a promise is liable at all, the promisor not being solely liable, the promise comes within the statute. Ordinarily, said the court, the question as to whom credit was given is one for the jury. The fact that Swarens' charges on his books were against Pfnisel alone, and not against Mrs. Amel, might not be controlling as a matter of law. The fact, however, that he sued both Pfnisel and Mrs. Amel, alleging that he had rendered services at the instance and request of both of them and prayed judgment against both shows beyond any question that credit was given to some extent at least to Pfnisel. In view of his conduct, Swarens cannot say that credit was extended Mrs. Amel alone. The fact that Swarens presented a bill made out to Pfnisel to Pfnisel's attorney tended further to prove that credit was extended in part at least to Pfnisel. The court held, therefore, that the promise made by Mrs. Amel came within the statute of frauds and was void because it was not in writing. The judgment of the court below, against Mrs. Amel, was reversed.

Compensation for Traumatic Neuroses

(Welchlin v. Fairmont Railway Motors (Minn.), 230 N. W. 897)

Welchlin was hit on the inner side of his right leg, near the groin, by the handle on the carriage of a lathe at which he was working. A persistent limp followed. Welchlin instituted proceedings to obtain compensation under the workmen's compensation act. At the time of the final hearing before the industrial commission, about five months after the accident, he had a straddling movement of the leg, which gave him a straddling gait. He was doing bookkeeping, apparently trying to learn, and getting nothing for it, although there was other work he might do.

Three physicians called by Welchlin testified that he was unable to work at his former employment, although his disability was not total. Two physicians called by the employer testified that he had suffered no serious injury, that he had recovered, that he could return to work if he would, and that his limp could be accounted for on the theory of a traumatic neurosis and was not disabling. There was no claim that Welchlin was actually or consciously malingering. One of the physicians who testified for the employer was of the opinion that a settlement of the case would not cause a disappearance of the limping but that if the case was settled and Welchlin got back to work at his machine he would forget his limp and a normal gait would be reestablished. The other medical witness called by the employer was of the opinion that the limp was due either to habit or to a traumatic neurosis. The commission awarded Welchlin compensation for temporary total disability up to the time of the hearing. It found, however, that at that time there was no disability whatever. Welchlin thereupon appealed to the Supreme Court of Minnesota.

Under the Minnesota workmen's compensation act, said the Supreme Court, the injured workman does not recover damages for an injury; he receives a stated compensation, fixed by the statute, as compensation for disability. He may have compensation for a neurosis if it is the proximate result of his injury and causes disability. A helpful statement of the situation in such cases as this appears in *Eaves* v. *Blaenclydah Colliery Co.* (1909), 2 K. B. 73, where the English court, in reversing the decision of a lower tribunal denying compensation, said:

> The learned judge says he thinks that although the man honestly believes he is not able to do the work, and although he is not shamming or malingering, it is sufficient for the employers to show that the muscular mischief is at an end. I am entirely unable to assent to that view. The effects of an accident are at least twofold: they may be merely muscular effects—they almost always must include muscular effects—and there may also be, and very frequently are, effects which you may call mental, or nervous, or hysterical whichever is the proper word to use in respect of them. The effects of this second class, as a rule, arise directly from the accident from which the man suffered just as much as the muscular effects do, and it seems to me entirely a fallacy to say that a man's right to compensation ceases when the muscular mischief is ended, though the nervous or hysterical effects still remain.

The evidence in the present case, said the Supreme Court, does not indicate that the partial disability will last long. It may take some effort on the part of the workman to put himself into normal condition, and there may be attendant pain. But, said the Supreme Court, we are unable to see how it can be found that no disability remains; there is a limited partial disability; the finding of the commission is not sustained. The order of the industrial commission was therefore reversed.

Evidence from Unauthorized Autopsy

(Streipe v. Hubbuch Bros. & Wellendorf (Ky.), 25 S. W. (2d) 358)

Streipe, in the course of his employment, fell from a ladder some eighteen or twenty feet high and died in a few minutes. He had always enjoyed the best of health and appeared in good health when he left home on the day of his death. Without the consent of his widow, an autopsy was performed. His widow applied to the workmen's compensation board for compensation. The physician who performed the autopsy and two physicians who attended at the instance of the insurance carrier testified that Streipe was suffering from myocarditis, which in their opinion caused his death, and the workmen's compensation board refused to give compensation. The order of the board was affirmed by the circuit court, and an appeal was taken to the Court of Appeals of Kentucky.

The only point at issue was the admissibility of the evidence of the physicians, based on the unauthorized autopsy. Without that evidence, the finding of the workmen's compensation board was without support. On behalf of the widow it was contended that the evidence was not admissible, because the inquest was illegally held. But even if the illegality of the inquest be conceded, said the Court of Appeals, that fact would not render the evidence of the physicians inadmissible. As a general rule, applied in practically all jurisdictions, courts do not concern themselves with the method by which a party has secured the evidence which he adduces. Evidence which is otherwise admissible will not be excluded because it was fraudulently, wrongfully or illegally obtained, with the single exception that evidence obtained by search or seizure contrary to constitutional inhibitions is inadmissible in criminal cases. In the present instance the proceeding was civil, not criminal. Moreover, the language of the constitution is: "The people shall be secure in their persons, houses, papers and possessions from unreasonable search and seizure." The words "persons," "houses" and "papers" may be excluded from consideration, as not descriptive of a corpse. The only question is whether a corpse is a "possession." The word "possessions" includes nothing but property and is confined in its application to things intimately associated with the person. The widow has certain rights in the corpse of her deceased husband, but the authorities uniformly hold that there is no right of property in the ordinary sense of that term, in the dead body of a human being. A corpse, said the court, is

not a possession, and an autopsy is not an unreasonable search and seizure within the contemplation of the constitution.

Even though the coroner's report of the inquest was inadmissible and was properly excluded, the workmen's compensation board did not err in admitting the evidence of the physicians as to what they saw during the autopsy. It was proper for them to give their opinions as to the cause of death.

Death from Inhalation of Poisonous Fumes

(Adler v. Interstate Power Co. (Minn.), 230 N. W. 486)

Adler, a stoker, in the course of his employment pulled out a charge from an upper retort and was exposed to the fumes of coal and coke. When he completed the task, he complained of a pain in his head and across his chest; he felt sick and vomited severely. He ceased work and was taken home and placed in a chair, from which he fell a few moments later and died. Immediately thereafter an autopsy was performed. In compensation proceedings instituted by the widow, the pathologist who performed the autopsy testified before the industrial commission that Adler's body was that of one of the healthiest men he had ever examined and that, in his opinion, Adler died "as a result of probably inhalation or injection of some poisonous substances, presumably derived in some way or other from the destructive distillation of coal." The conclusion of the pathologist was not disputed, nor was any other cause of death suggested. The commission nevertheless denied compensation. The widow appealed to the Supreme Court of Minnesota, which reversed the decision of the commission.

All causes of death other than the inhalation or injection of poisonous substances coming from the distillation of coal, said the Supreme Court, were eliminated, so far as was possible, in the hearing before the industrial commission. The conclusion of the pathologist was not disputed. No cause other than the one he assigned was suggested. If compensation be denied, the opinion reached by a competent pathologist, given with a rather definite degree of certainty, after as thorough an autopsy as could be performed and under as favorable conditions as could be had, must go for naught, and the cause of death be unascertained. This cannot be so. It is true that the physician could not testify as to an exact certainty. He could not give the definite gas or poisons or combination which brought about the result; it is true that he admitted under cross-examination that in reaching results there might be such a thing as conjecture or speculation. There is no question of his credibility. The burden of proof, of course, is on the claimant, and she cannot rest a recovery merely on speculation or conjecture. In the practical administration of the compensation act, however, the unassailed opinion of the physician, with the uncontradicted circumstances supporting it, should be taken as a correct statement of cause of death.

The employer and the insurance company, however, contended that even conceding that death came from an inhalation or injection of gas or poison, it was not an accident. The workmen's compensation act, said the Supreme Court, defines an accident as "an unexpected or unforeseen event, happening suddenly and violently, with or without human fault, and producing at the time injury to the physical structure of the body." G. S. 1923 (1 Mason, 1927), Sec. 4326(h). The evidence here presented clearly indicates an accidental injury.

Malpractice: Care and Skill Correlated.—The physician owed the plaintiff a duty to exercise ordinary care and skill. His failure to exercise either would be negligence. If he was incompetent and attempted an operation which he knew he could not perform, it would be negligence. So the term "negligence" covers not only a lack of care but also failure to exercise skill which the person possesses and the attempt to exercise skill which he knows he does not possess.—*Rothschild v. Barck (Mo.), 26 S. W. (2d) 760.*

Malpractice: Unpleasant Taste Not Actionable.—An unpleasant sensation as a result of the negligent act of another, without physical or material damage, cannot be the basis of an action for damages. Where, through the negligence of a dentist, a patient is caused to swallow a bitter and ill-tasting liquid, but sustains no ill effects other than the disagreeable stimulation of the sense of taste, the patient has suffered no actionable damage. The mere fact that one event chronologically follows another is insufficient to prove a causal relation between them. Evidence that a woman suffered a pain in her heart and other physical ailments after having swallowed a liquid—the nature and character of which does not appear, except that it was suitable for hypodermic use by a dentist, while operating in a patient's mouth, and possessed a bitter and disagreeable taste—is, in the absence of evidence tending to show a causal relation, insufficient to authorize an inference of fact that her condition was caused by swallowing the liquid.—*Payne v. Chandler (Ga.), 153 S. E. 96.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Birmingham, April 21-24. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.
American Association for the Study of Goiter, Kansas City, Mo., April 7-9. Dr. J. R. Yung, 670 Cherry Street, Terre Haute, Ind., Secretary.
American Association of Anatomists, Chicago, April 2-4. Dr. George W. Corner, University of Rochester School of Medicine, Rochester, N. Y., Secretary.
American Association of Pathologists and Bacteriologists, Cleveland, April 2-3. Dr. H. T. Karsner, 2085 Adelbert Road, Cleveland, Sec'y.
American College of Physicians, Baltimore, March 23-27. Mr. E. R. Loveland, 133 South 36th Street, Philadelphia, Executive Secretary.
American Gastro-Enterological Association, Atlantic City, May 4-5. Dr. Charles G. Lucas, 307 West Broadway, Louisville, Secretary.
American Orthopedic Association, Memphis, Tennessee, April 15-18. Dr. DeForest P. Willard, 1916 Spruce Street, Philadelphia, Secretary.
American Pediatric Society, Edgewater Park, Mississippi, April 15-17. Dr. H. C. Carpenter, 1805 Spruce Street, Philadelphia, Secretary.
American Physiological Society, Montreal, April 8-11. Dr. Arno B. Luckhardt, 5216 Greenwood Avenue, Chicago, Secretary.
American Society for Clinical Investigation, Atlantic City, May 4. Dr. Cyrus C. Sturgis, Simpson Memorial Institute, Ann Arbor, Mich., Sec'y.
American Society for Experimental Pathology, Montreal, April 8-11. Dr. C. Phillip Miller, Jr., University of Chicago Department of Medicine, Chicago, Secretary.
American Society for Pharmacology and Experimental Therapeutics, Montreal, April 8-11. Dr. E. D. Brown, University of Minnesota Medical School, Minneapolis, Secretary.
American Society of Biological Chemistry, Montreal, April 8-11. Dr. H. B. Lewis, University of Michigan Medical School, Ann Arbor, Mich., Secretary.
Arizona State Medical Association, Nogales, May 7-9. Dr. D. F. Harbridge, Goodrich Building, Phoenix, Secretary.
Arkansas Medical Society, Texarkana, April 21-24. Dr. William R. Bathurst, Boyle Building, Little Rock, Secretary.
Association of American Physicians, Atlantic City, May 5-6. Dr. James H. Means, Massachusetts General Hospital, Boston, Secretary.
California Medical Association, San Francisco, April 27-30. Dr. Emma W. Pope, 450 Sutter Street, San Francisco, Secretary.
Conference of State and Provincial Health Authorities of North America, Washington, D. C., April 29-30. Dr. A. J. Chesley, State Board of Health, St. Paul, Minnesota, Secretary.
District of Columbia, Medical Society of, Washington, May 6. Dr. C. B. Conklin, 1718 M Street, N. W., Washington, Secretary.
Federation of American Societies for Experimental Biology, Montreal, April 8-11. Dr. H. B. Lewis, University of Michigan Medical School, Ann Arbor, Mich., Secretary.
Florida Medical Association, Orlando, May 11-12. Dr. Shaler Richardson, 111 West Adams Street, Jacksonville, Secretary.
Georgia, Medical Association of, Atlanta, May 12-15. Dr. Allen H. Bunce, 139 Forrest Avenue, N. E., Atlanta, Secretary.
Hawaii Territorial Medical Association, Wailuku, Maui, May 1-2. Dr. F. J. Pinkerton, Young Building, Honolulu, Secretary.
Illinois State Medical Society, East St. Louis, May 5-7. Dr. Harold M. Camp, Lahl Building, Monmouth, Secretary.
Iowa State Medical Society, Des Moines, May 13-16. Dr. Robert L. Parker, 3510 Sixth Avenue, Des Moines, Secretary.
Kansas Medical Society, Manhattan, May 5-7. Dr. J. F. Hassig, Huron Building, Kansas City, Secretary.
Louisiana State Medical Society, New Orleans, April 14-16. Dr. P. T. Talbot, 1430 Tulane Avenue, New Orleans, Secretary.
Maryland, Medical and Chirurgical Faculty of, Baltimore, April 28-30. Dr. John T. King, Jr., 1211 Cathedral Street, Baltimore, Secretary.
Minnesota State Medical Association, Minneapolis, May 4-6. Dr. E. A. Meyerding, 11 West Summit Avenue, St. Paul, Secretary.
Mississippi State Medical Association, Jackson, May 12-14. Dr. T. M. Dye, Clarksdale, Secretary.
Missouri State Medical Association, Joplin, May 11-14. Dr. E. J. Goodwin, 634 North Grand Boulevard, St. Louis, Secretary.
National Tuberculosis Association, Syracuse, N. Y., May 11-14. Dr. Charles J. Hatfield, Henry Phipps Institute, Philadelphia, Secretary.
Nebraska State Medical Association, Omaha, May 12-14. Dr. R. B. Adams, Center McKinley Building, Lincoln, Secretary.
North Carolina, Medical Society of the State of, Durham, April 20-22. Dr. L. B. McBrayer, Southern Pines, Secretary.
Ohio State Medical Association, Toledo, May 12-15. Mr. Don K. Martin, 131 East State Street, Columbus, Secretary.
Oklahoma State Medical Association, Oklahoma City, May 11-13. Dr. C. A. Thompson, Memorial Station, Muskogee, Secretary.
South Carolina Medical Association, Greenville, May 5-7. Dr. E. A. Hines, Seneca, Secretary.
Tennessee State Medical Association, Knoxville, April 14-16. Dr. H. H. Shoulders, 706 Church Street, Nashville, Secretary.
Texas, State Medical Association of, Beaumont, May 5-7. Dr. Holman Taylor, Medical Arts Building, Fort Worth, Secretary.

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Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal Diseases of Children, Chicago

41: 1-224 (Jan.) 1931

Value and Duration of Immunity Conferred by Antidiphtheritic Anatoxin: Titration of Antitoxin Present in Serum of Vaccinated Children. G. Ramon and R. Debré, Paris, France.—p. 1.

Diphtheria Immunization: Percutaneous Method of Loewenstein. A. F. Abt, Chicago, and B. F. Feingold, Glencoe, Ill.—p. 8.

*Sonne Dysentery: Thirty Cases. R. L. Nelson, Boston.—p. 15.

*Tuberculosis in Schools in Colorado. R. P. Forbes, R. Verploeg and M. K. Bazemore, Denver.—p. 26.

Inexpensive Incubator for Premature Infants. A. H. Parmelee, Oak Park, Ill.—p. 33.

Cell and Plasma Chloride in Pyloric Stenosis of Infants. M. Maizels and C. B. McArthur, Westminster, London.—p. 35.

*Professor Loewenstein's Ointment for Active Immunization Against Diphtheria. A. H. Kegel and B. M. Gasul, Chicago.—p. 45.

Dietary Protein and Blood-Clotting Function. I. N. Kugelmass and E. L. Samuel, New York.—p. 48.

Intraperitoneal Iron. C. G. Grulee and H. N. Sanford, Chicago.—p. 53.

*Rickets: Value of Colorado Sunshine in Prevention. H. B. Stein and R. C. Lewis, Denver.—p. 62.

*Comparison of Antirachitic Effects of Winter and Summer Sunshine in Colorado. R. C. Lewis, G. M. Frumess and H. B. Stein, Denver. —p. 71.

Pericarditis with Effusion. L. P. Sutton, New York.—p. 78.

Mediastinal Teratoma in Infant. H. B. Wilcox and M. Wollstein, New York.—p. 89.

Subacute Bacterial Endarteritis of Pulmonary Artery Associated with Patent Ductus Arteriosus and Pulmonic Stenosis. H. Gordon and D. Perla, New York.—p. 98.

Empyema of the New-Born. J. Glaser and J. Epstein, Rochester, N. Y. —p. 110.

*Ulcerative Laryngitis Due to Corynebacterium Ulcerans. J. G. M. Bullowa, New York, and M. Jacobi, Brooklyn.—p. 120.

*Juvenile Embolic Gangrene of Upper Extremity. J. D. Craig and W. E. Muns, New York.—p. 126.

Wheezing Respiration in Children: Stridorous and Asthmatoid Breathing. C. Jackson, Philadelphia.—p. 153.

Sonne Dysentery.—Attention is drawn by Nelson to the possible importance of *Bacterium dysenteriae* Sonne as a cause of dysentery in children. Methods for the isolation and identification of the organism are given. Clinical features of the disease with eight case histories and clinical charts illustrative of the mild and severe forms are given.

Tuberculosis in Schools in Colorado.—A survey for tuberculosis made by Forbes et al. in the school of a small community composed largely of health seekers, where contact with the disease is unusually great, showed 36.4 per cent of 283 children from 4 to 15 years of age to be infected. This is only a moderate increase over the incidence noted in nontuberculous communities. Roentgen studies of the 103 children giving positive reactions revealed childhood tuberculosis in 19, or 6.7 per cent, of the whole group, the average for the country at large varying from 1 to 4 per cent. No child with the adult or exudative type of tuberculosis was found. Most of the children reacting positively and those having actual childhood tuberculosis were not born in Colorado. Climatic factors in Colorado apparently exert a favorable influence in the protection of children against active tuberculous infection. In this study, the father was the source of infection in 64.8 per cent of the children giving positive reactions, and the mother in only 12.6 per cent. Symptoms of fatigue, undernutrition and a history of frequent colds are said to be not reliable aids in the diagnosis of childhood tuberculosis.

Loewenstein's Ointment for Immunization Against Diphtheria.—Twenty-six, or 55.3 per cent, of forty-seven children who were given three inunctions of Loewenstein's ointment for active immunization against diphtheria gave negative reactions to the Schick test within six weeks. No local or general reactions were noted by Kegel and Gasul.

Rickets: Colorado Sunshine in Prevention.—Experiments made by Stein and Lewis show that in Colorado direct sunlight in June and July has a marked antirachitic action on rats, even when the average daily exposure is as little as three and three-fourths minutes. Only a mild degree of rickets is evident in rats exposed to direct sunlight for seven and one-half minutes. The high antirachitic potency of Colorado sunshine may be explained by the fact that the atmosphere is relatively free from moisture and smoke. Sunshine has an apparent beneficial effect on growth.

Antirachitic Effects of Winter and Summer Sunshine in Colorado.—The experimental results obtained by Lewis et al. do not support the contention of Tisdall and Brown, at least as far as Colorado is concerned, that suddenly about the first of March there is a marked increase in the amount of ultraviolet radiations reaching the earth. There is no marked difference in the antirachitic effect of winter and summer sunshine in Colorado. The comparatively high antirachitic action of Colorado sunshine with relatively little seasonal variation as compared with that of other places where similar studies have been made may be explained on the ground that throughout the year relatively short wave radiations reach the earth as a result of the high percentage of winter sunshine, the low humidity and the small amount of smoke in the atmosphere.

Ulcerative Laryngitis.—A case of fatal ulcerative laryngitis due to an atypical organism resembling the diphtheria bacillus and producing only a slight fibrinous reaction is reported by Bullowa and Jacobi. The organism yielded by a culture from a laryngeal ulcer was identified as the *Corynebacterium ulcerans* of Gilbert and Stewart, previously isolated only from nonfatal upper respiratory infections. Both organisms produce extensive necrosis and ulceration without the formation of a typical diphtheritic pseudomembrane. The immunologic study of cases of diphtheria not responding to antitoxin is suggested.

Juvenile Embolic Gangrene of Upper Extremity.—A case of aortic stenosis of rheumatic origin with an accompanying embolic gangrene of the right hand in a child is reported by Craig and Muns.

American Journal of Orthopsychiatry, Menasha, Wis.

1: 107-237 (Jan.) 1931

One Hundred Problem Children for Whom Foster Care Was Advised. C. D. Hopkins and A. R. Haines, Chicago.—p. 107.

Drawings by Children as Aids to Personality Studies. K. E. Appel, Philadelphia.—p. 129.

Inquiry into Status of Psychiatric Social Work. M. C. Scoville, New York.—p. 145.

Relationship Between Intelligence and Economic Status as Factors in Etiology of Children's Behavior Problems. J. Levy, New York.—p. 152.

Retraining in Reading: New Method. J. Regensburg, New York.—p. 163.

Causes of Delinquency in Relation to Family Attitudes. B. E. Moulton, Boston.—p. 173.

Study of Personalities of Gifted Students by Means of Control Group. A. M. Conklin.—p. 178.

Talks on Mental Hygiene to Classes of Grammar School Children. H. P. Taussig, Newark, N. J.—p. 184.

Personality Studies in Nursery School Group. N. L. Perkins, Detroit. —p. 193.

American Journal of Pathology, Boston.

7: 1-86 (Jan.) 1931

*Comparison of Inclusion Bodies of Fowlpox and Molluscum Contagiosum. E. W. Goodpasture and C. E. Woodruff, Nashville, Tenn.—p. 1.

*Transformation of Sinusoidal Endothelium into Ordinary Capillary Type. F. A. McJunkin, Chicago.—p. 9.

*Benign Polymorphocellular Tumors of Knee Region. W. C. Hunter, Portland, Ore.—p. 13.

*Circulatory Pattern in Islands of Langerhans. J. S. P. Beck and B. N. Berg, New York.—p. 31.

*Interacinar Epithelium of Thyroid. A. R. Moritz, Cleveland.—p. 37.

Suggestions for Silver Impregnation of Connective Tissue. L. Guyon, Paris.—p. 47.

*Experimental Glomerulonephritis in Monkey. E. T. Bell and B. J. Clawson, Minneapolis.—p. 57.

*Hypernephroma with Tumor Thrombosis of Vena Cava and Heart. S. H. Polayes, and H. Taft, Brooklyn.—p. 63.

*Chronic Typhoid Cholecystitis. T. B. Malloy and G. M. Lawson, Jr., Boston.—p. 71.

*Infectious Cirrhosis. H. E. MacMahon, Boston.—p. 77.

Inclusion Bodies of Fowlpox and Molluscum Contagiosum.—Goodpasture and Woodruff state that the inclusion bodies of molluscum contagiosum may be freed from surrounding cellular material by tryptic digestion. Unlike fowlpox

inclusions, the molluscum bodies are found to be sticky and gelatinous after they have been digested. Because of this characteristic they cannot be manipulated readily with the Chambers microdissection apparatus. The gelatinous matrix of the molluscum bodies has a markedly granular appearance, owing to the presence within it of myriads of Lipschütz granules—minute coccoid structures, 0.25 micron in diameter. These granules are identical in size, shape and staining reactions with the Borrel bodies of fowlpox. They are resistant to the action of trypsin. The inclusion bodies of molluscum, on being placed in distilled water, show little or no swelling. Under similar conditions the fowlpox inclusions swell markedly, as the result, probably, of their lipoid material acting as a semipermeable membrane. Trituration of the molluscum inclusions readily breaks them up into the component Lipschütz granules. Fowlpox inclusions, similarly treated, fail to break up so readily into Borrel bodies. This difference in the reaction of molluscum and fowlpox to trituration may afford an explanation for the relatively greater filtrability of the former. Fowlpox and molluscum contagiosum are apparently specific for fowls and man, respectively, cross-inoculation experiments having proved unsuccessful. Attempts to transfer molluscum to monkeys and other laboratory animals were also unsuccessful.

Transformation of Sinusoidal Endothelium into Capillary Type.—In granulation tissue produced within the liver of rats, McJunkin noted that the capillaries may arise in the usual way by angioblastic proliferation, or sinusoids may persist as capillaries. In both instances the vessels are continuous with the sinusoids in the adjoining lobules. With loss of contact with living hepatic epithelium, the endothelium becomes less phagocytic. The peculiarities of sinusoidal endothelium depend on its functional activity, which, in turn, is determined by its normal histologic position. From the behavior of sinusoidal endothelium present in granulation tissue, it appears not to be a distinctive type of cell.

Polymorphocellular Tumors in Region of Knee.—Hunter describes two instances of benign polymorphocellular tumors occurring in the region of the knee in closely related persons. In the daughter, the new growth originated in the synovial membrane, a rare site for the formation of tumors, and was benign. In the father, the tumor was of exceptionally long duration, attained very bulky dimensions and although exhibiting locally destructive properties also appears to have been benign. Because of the large size and extensive ramifications of the mass, the point of origin could not be determined, but certain facts point to an extra-articular source. Most commonly, new growths of the type reported arise from the sheaths of tendons and only rarely from the capsule or synovial membrane of joints. In the latter event the knee is much more frequently involved than any other joint in the body. The rarity of such growths of the joints is evidenced by the fact that the author was able to collect from the literature, in addition to his own cases, only forty-four instances of closely similar or identical tumors.

Circulatory Pattern in Islands of Langerhans.—Beck and Berg made anatomic studies of the circulatory pattern in the islands of Langerhans in white mice. The arrangement consists of a network of capillaries which are supplied with blood through afferent arterioles, empty into efferent venules, and anastomose freely with interacinar capillaries. An analysis of the vascular system of the islands shows that the arrangement of the vessels favors the circulation of a large volume of blood with maximum efficiency. Since the arterial pressure diminishes directly with the length of the vessel, it is higher at the end of a short arteriole than at the end of a longer one, assuming the diameters to be equal. Therefore the short direct arterioles to the islands afford a higher pressure for the column of blood entering the capillary network than the long arterioles supplying the capillaries of the acinar tissue situated at the periphery of the lobules. When the capillary bed of the islands is large, more than one arteriole is present. On the venous side, the multiple short efferent venules of the islands insure a low venous pressure with minimal resistance to the egress of blood. Regardless of the position of the islands in the pancreatic lobules, the dynamics of the circulation remain unaltered. These pressure relationships explain why the islands remain intact in advanced chronic passive congestion, whereas the acini in the peripheral parts of the lobules undergo extensive atrophy. On the one hand, the pressure in the short arterioles to the islands is sufficient to overcome the increased resistance in the venous system. On the other hand, the pressure in the arterioles to the outlying acini is insufficient to overcome the venous resistance, which is augmented by stasis in the long efferent venules. As a result, the nutrition of the islet cells remains undisturbed while degeneration of the acini occurs. The few acini that remain intact are found in the immediate vicinity of the islands, where the circulation is best. When thrombosis, embolism, sclerosis or spasm of the afferent arterioles occur, the capillary anastomoses can form a collateral circulation, which maintains an adequate blood supply to the islands. This mechanism probably accounts for the few changes that are observed in the islands in the presence of arteriolar lesions. Examination of the circulatory patterns of the islands of Langerhans in the pancreas of the guinea-pig, white rat, monkey and man revealed that they were similar to those of the white mouse.

Interacinar Epithelium of Thyroid.—Moritz states that in normal thyroids of fetuses, children and adults, in pathologic glands the seat of hypertrophy and hyperplasia, in nodular goiter, and in adenomas of the thyroid, the mechanics of hyperplasia are essentially similar. New follicles are formed by intrafollicular and extrafollicular proliferation of epithelium and the secondary follicles may lose their parent connection and become isolated units. In the scattered foci of hyperplasia in normal thyroids, as well as in glands that are the seat of pathologic hypertrophy and hyperplasia, labyrinthine intercommunication of acini exists and is probably limited to the connection of primary with secondary acini. Solid masses of undifferentiated interfollicular epithelium are found in both normal and pathologic glands, but such masses are readily accounted for as detached extrafollicular buds. Evidence contrary to certain observations by Rienhoff concerning the mechanics of hyperplasia in the thyroid is presented.

Experimental Glomerulonephritis in Monkey.—Bell and Clawson produced a form of chronic diffuse glomerulonephritis in a monkey by repeated intravenous injections of streptococci over a period of four years. The lesion was characterized histologically by marked increase in capillary endothelium and increase in the thickness and number of layers of the capillary basement membrane. Histologically the glomerular lesion resembled human "lipoid nephrosis of mixed type," except that no fat was present.

Hypernephroma with Tumor Thrombosis of Vena Cava and Heart.—Polayes and Taft report a case of hypernephroma with malignant thrombosis by invasion of the inferior vena cava and heart. It is the fifth case described and was unique in its extent of involvement. The entire inferior vena cava and all its main tributaries (iliac, renal and hepatic veins) were occluded by a continuous malignant thrombus, which extended into the right atrium, through the tricuspid valve into the right ventricle. The cardiac involvement here was even more extensive than in the case described by Weber, in which the thrombus did not extend beyond the right atrium. Another interesting feature was the fact that, in spite of the massive involvement of the inferior vena cava and the right kidney, the right suprarenal remained singularly free from metastasis.

Chronic Typhoid Cholecystitis.—Mallory and Lawson describe the gross and histologic appearance of the gallbladders of seven typhoid carriers. A common histologic picture was found. A review of 400 routine slides of chronic cholecystitis showed a similar lesion in 6.5 per cent of the cases. A review of the clinical histories showed that only 4.9 per cent of the cases with negative histories showed this picture, as against 25 per cent of cases with positive histories. It is felt that the lesion described is characteristic of chronic typhoidal cholecystitis but not pathognomonic of it. It is suggested that it is not specific of any organism but represents a reaction to persistent infection of the bile in contrast to the more usual type of chronic cholecystitis with sterile bile and persistent infection of the wall.

Infectious Cirrhosis.—According to MacMahon, uncomplicated infectious cirrhosis is one of the rarer diseases of the liver. It is caused probably in most instances by the colon

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bacillus and is characterized by a variable degree of connective tissue and bile duct proliferation about the portal areas. Obstructive cirrhosis resulting from prolonged biliary obstruction is a much more common condition although less conspicuous and hence frequently overlooked. Most cases of infectious cirrhosis are found in combination with obstructive cirrhosis, but even this combined type is relatively rare and is almost invariably fatal.

American J. Roentg. & Radium Therapy, New York

25: 1-144 (Jan.) 1931

Mouse Ovaries Following Exposure to Roentgen Irradiation. J. M. Murray, Bar Harbor, Maine.—p. 1.
Cholecystographic Diagnosis of Papillomas of Gallbladder. B. R. Kirklin, Rochester, Minn.—p. 46.
*Peptic Ulcer: Diagnostic Value of Roentgen Ray Before and After Treatment. E. S. Emery, Jr., and R. T. Monroe, Boston.—p. 51.
*Roentgenologic Findings in Seventy-Two Cases of Traumatic Myelitis Due to Fracture of Spine. E. S. Gurdjian, Detroit.—p. 65.
Methods Used for Measuring Roentgen Ray Applied Intensity. U. V. Portmann, Cleveland.—p. 74.
High Voltage Roentgen Radiation (200 Kv.) on Fertility and Motility of Sperm of Rabbit. S. A. Asdell, Ithaca, N. Y., and S. L. Warren, Rochester, N. Y.—p. 81.
Meniscus Calcification: Roentgen Findings in Disease of Menisci. M. Israelski, Berlin, Germany.—p. 85.
Tuberculosis Ulceration of Duodenum. R. J. Reeves, Durham, N. C. —p. 88.
Dwarfism Due to Disordered Epiphyseal Development. H. E. Ruggles, San Francisco.—p. 91.

Peptic Ulcer: Diagnostic Value of Roentgen Ray.—A study has been made by Emery and Monroe of the value of the roentgen ray to the clinician in following the treatment of patients with ulcer of the stomach or duodenum. The accuracy of the roentgen examination is shown to be high as compared with most kinds of laboratory procedures. However, it is a mistake for clinicians to place implicit confidence in the results of the roentgen observations and to discard entirely the older methods of investigation. It was found that a correct diagnosis was reached in 93 per cent of those patients having an ulcer. Retention as shown by roentgen examination was found to give a true picture of clinical retention in 67 per cent of cases. The presence or absence of tenderness over an ulcer was found to have no clinical value. A study of the roentgen observations and the clinical symptoms shows that it is not possible to diagnose a healed duodenal ulcer by the roentgen ray. Moreover, the data support the idea that duodenal ulcer is a chronic disease, which is rarely cured by treatment.

Traumatic Myelitis Due to Fracture of Spine.—Gurdjian asserts that roentgen studies are important in cases of fractured spine with cord injury. Although films can be of aid in diagnosis, they should always be considered in association with other methods of clinical and laboratory approach. Some cases of certain transection of the cord on the basis of roentgen observations may not show any signs of cord damage even on neurologic examination.

Canadian Medical Association Journal, Montreal

24: 1-180 (Jan.) 1931

*Recoil Following Visceral Decompression. W. I. de C. Wheeler, Dublin. —p. 3.
Things New and Old. D. A. Stewart, Ninette, Manitoba.—p. 9.
Pursuit of Health. R. Hutchinson, London.—p. 16.
*Analgesia and Anesthesia in Childbirth. A. L. McIlroy, London.—p. 21.
*Treatment of Paranasal Suppuration Persisting After Operation. P. G. Goldsmith, Toronto.—p. 27.
Filtrable Viruses and Practical Medicine. S. P. Bedson, London.—p. 36.
Addison's Disease. J. M. Rogoff, Cleveland, Ohio.—p. 43.
Diagnostic Points in Gynecology. H. P. Watson, New York.—p. 51.
Avertin. F. B. Parsons, Cambridge.—p. 59.
Indications and Contraindications for Spinal Anesthesia. J. Parry, Hamilton, Ont.—p. 64.
Acute Obstruction of Small Bowel. G. H. Stobie, Belleville, Ont.—p. 70.
Functional Basis of More Common Gastric Symptoms. M. J. Wilson, Toronto.—p. 74.
*Administration of Gastric Antacids. J. F. A. Johnston and V. E. Henderson, Toronto.—p. 77.
Diagnosis and Treatment of Renal Calculi. G. S. Foulds, Toronto.—p. 79.
Kirschner Method of Skeletal Traction in Treatment of Fractures. R. R. Fitzgerald, Montreal.—p. 83.

Recoil Following Visceral Decompression.—Wheeler emphasizes the fact that, when an organ or system is suffering directly from pressure effects or indirectly from back pressure, the greater the pressure the more gradual should be its relief. This applies particularly to such conditions as uremia, following the release of back pressure on the kidneys, hepatic shock in portal obstructions or obstructions of the common duct, with or without ascites, toxemia, and other morbid conditions in the presence of intestinal obstruction, and flapping mediastinum in acute empyema. The dangers attending a too generous tapping of the pleural or peritoneal cavities for effusions, and the risks of spinal puncture when the pressure is high, are also included. The problems involved, however, are by no means confined to the realm of surgery. One finds patients with back pressure on the heart from disease and narrowing of the arteries, with resultant hypertrophy, dilatation, and cardiac failure. As the back pressure continues and increases, compensation fails and secondary lethal changes (often renal) complete the picture. If it were possible by the use of drugs to reduce the blood pressure suddenly, the "cure" would be admittedly worse than the disease; cardiac and renal failure would inevitably result. Physicians insist that only those depressor drugs should be chosen which have the slowest and most prolonged action. Anesthetists are alive to the the dangers of sudden decompression. Anesthesia by spinal injection or chloroform inhalation must be cautiously adopted or entirely avoided in the presence of high blood pressure. The rapid fall so frequently noted if either of these methods is employed produces at times an alarming reaction, including sudden failure of the cardiac pump or stoppage of renal function. In ophthalmic departments the ophthalmologist deals with glaucoma by the very slow withdrawal of aqueous humor from the anterior chamber. By gradual decompression, vascular dilatation, intra-ocular hemorrhage and retinal detachments are avoided. Obstetricians are concerned in cases of hydramnios. If the formation of fluid is slow, the system accommodates itself to the increasing pressure, but if it is rapid, the circulation suffers; the lips, hands and feet become cyanosed; there is indigestion and vomiting, and albumin appears in the urine. Bursting of the membranes, on the other hand, causes a recoil that induces syncope by rapid reduction of intra-abdominal tension. When inducing labor in cases of hydramnios, the obstetrician lays especial stress on the necessity for preventing a sudden outpouring of the fluid. To effect this control and to insure the slow escape of the waters, a very small or valvular aperture is provided. Again, in cases of imperforate hymen leading to hematocolpos, the obstructing membrane is punctured with a trocar and cannula and the fluid allowed to drain slowly away during the first twenty-four hours. If the fluid is not drained slowly, the patient may pass into a condition that is usually described as one of extreme shock.

Analgesia and Anesthesia in Childbirth.—McIlroy states that each maternity case must be given individual attention with regard to the most suitable sedative and anesthetic to be employed. The age, parity, temperament, general health and complications, if present, must all be carefully considered. Obstetric anesthesia is not quite comparable with the surgical form. The pain is prolonged and has to be combated with sedatives as well as with anesthetics; the effect of these sedatives must be taken into consideration when an anesthetic is decided on. Light anesthesia is of little use in surgery, while it is generally employed in midwifery practice, except in cases in which operative intervention is required. The action of the uterus must be maintained, and hemorrhage after delivery must be prevented as far as possible. The expenditure of time, with its consequent financial complications, is a consideration. It is desirable that private patients should have the continuous attendance of the practitioner during labor, if sedatives or anesthetics are to be given, just as in a hospital practice. It is a common mistake to carry out violent methods of artificial respiration if the infant does not breathe immediately after birth. One has to remember that it is narcotized to some extent and requires time to recover; warmth, rest and clearance of its respiratory passages are sufficient in most cases of delayed respiration, but carbon dioxide and oxygen should be given if there is any undue delay.

Paranasal Suppuration Persisting After Operation.—Goldsmith believes that persistence of discharge from any nasal accessory sinus after operation does not necessarily demand further surgical measures of a more radical nature. The main symptoms for which the patient consulted the physician, such

as pain or discomfort in the head, nasal or postnasal discharge, nasal obstruction, recurring "head colds" or mental depression or lessening of the power of concentration, may have been so greatly benefited that even if some nasal or sinus secretion persists it may not be of sufficient importance to require further instrumental intervention. The extraordinary efforts made to detect the slightest amount of mucoid secretion in an accessory air cell and the ridiculous importance allotted to its presence are further evidences of the extent to which the subject of foci of infection has clouded clinical vision and made physicians forget their elementary physiology. Taking each cavity by itself, the author enumerates some of the reasons for failure in operative treatment to secure complete relief from undue secretion.

Administration of Gastric Antacids.—An examination of the literature on this subject by Johnston and Henderson revealed the fact that sodium bicarbonate is now much less favored than it was some years ago. If excess amounts of sodium bicarbonate or of magnesium oxide are added to a hydrochloric acid solution of the strength of gastric juice (0.3 per cent), the solution becomes alkaline within one minute; but the alkalinity produced by sodium bicarbonate and magnesium oxide leads in turn to a fresh secretion of gastric juice. If sodium citrate is added to such a solution of hydrochloric acid, the mixture will give an acid reaction with certain indicators and a neutral reaction with others. One would expect to find in such a mixture sodium chloride, some sodium citrate, citric acid and a trace of hydrochloric acid. Apparently it would contain as much acid as the original hydrochloric acid, and by titrating the mixture with sodium hydroxide solution and a suitable indicator this would be the result obtained. But, today, acidity is judged rather by the amount of free hydrogen ion present, and by this standard the mixture will have a neutral reaction, which is expressed as p_H 7.0. The original hydrochloric acid solution would be very acid (p_H 1.0). This is due to the fact that the citric acid in such a solution largely exists as citric acid and liberates very few hydrogen ions, while in such a hydrochloric acid solution almost all the hydrogen ions are free. The same type of reaction occurs with potassium citrate, or any acetate. If tribasic calcium and magnesium phosphates are added to an artificial gastric juice the mixture becomes neutral (p_H 7.0) in a minute and stays neutr.[1]. Calcium carbonate brings about neutrality more slowly, but the mixture does not become alkaline (i. e., does not attain a p_H of more than 7.0). Bismuth carbonate only reduces the acidity (to p_H 4.0). By weight, magnesium oxide is the most efficient neutralizer. About four times as much sodium bicarbonate and five times as much of the citrates or tribasic phosphates are required.

Endocrinology, Los Angeles

14: 385-461 (Nov.-Dec.) 1930

*Rôle of Pituitary Posterior Hormone in Fat Metabolism. W. Raab, Prague, Vienna.—p. 385.
Estrogenic Substances: Analysis of Plant Sources. B. S. Walker and J. C. Janney, Boston.—p. 389.
*Iodine Reaction in Exophthalmic Goiter. W. O. Thompson and P. K. Thompson, Chicago.—p. 393.
*Effect of Anterior Pituitary Extract on Developing Albino Mouse. G. E. Johnson and R. T. Hill, Manhattan, Kan.—p. 400.
Stimulative Effect of Roentgen Rays on Glands of Internal Secretion. M. B. Gordon, Brooklyn.—p. 411.

Pituitary Posterior Hormone in Fat Metabolism.—On the basis of a series of experiments on dogs, Raab states that large subcutaneous or smaller intraventricular doses of pituitary extract decrease the neutral fat content of the blood. The reaction is abolished by mechanical destruction or pharmacologic paralysis of the centers in the tuber cinereum, after transection of the spinal cord, after paralysis or section of the abdominal splanchnic, or after paralysis of the latter with ergotamine, or after phosphorus poisoning. An accumulation of fat in the liver and a decrease of the peripheral tissue fat has been noted after injection of pituitary extract. The conclusion is drawn that pituitary extract promotes the absorption and destruction of circulating fat by the liver through a nervous pathway starting in the tuber cinereum and running through the cervical spinal cord and the abdominal splanchnic to the liver. Any disturbance of the cooperative pituitary-mesencephalic system would lead to a retention of excess amounts of fat in the body and thus lead to obesity. Comparative determinations of arteriovenous fat suggest that pituitary extract does not affect deposit fat directly. There seems to be a close relationship between the pituitary extract nervous mechanism for fat destruction and the so-called chemical heat regulation. The author has observed verified cases of purely hypophyseal and purely mesencephalic obesity.

Iodine Reaction in Exophthalmic Goiter.—According to the Thompsons, in Boston the smallest amount of iodine that will produce any reduction in basal metabolism in exophthalmic goiter is greater than 0.75 mg. daily in about two thirds of the cases. The minimum amount that will produce a maximum reduction is roughly 6 mg. daily in the majority of cases. Between these two limits, the relation between the percentage approach of the basal metabolism toward the normal level and the size of the dose is roughly linear. The effective dose has not been determined in Chicago, but it is known that 6 mg. a day will cause a marked reduction in basal metabolism in some cases. Iodine must be administered at a certain minimum rate in order for the maximum effects to be produced. It also appears that this rate may be one that is sufficient to cause colloid to be stored at an adequate rate. In a few cases the reaction to iodine is reversible. The administration of a small dose, such as 1.5 mg. daily, may sometimes interfere with the effect of a much larger dose administered immediately afterward. In the routine treatment of the disease, it is desirable to give initially an excess of iodine sufficient to produce maximum effects. The amount necessary to do this is undetermined but probably is not more than 30 mg. (roughly 5 drops of the compound solution) daily. In patients who develop refractoriness to iodine, it is wise to postpone operation until iodine has been omitted long enough to allow the refractoriness to disappear. In a large percentage of mild cases of the disease improvement may be maintained for long periods by iodine, whereas moderately severe or severe cases rarely show more than temporary improvement. Myxedema may occasionally develop during the administration of iodine to patients who have a normal basal metabolism following subtotal thyroidectomy for exophthalmic goiter and to patients with mild untreated cases of the disease.

Effect of Anterior Pituitary Extract on Albino Mouse.—Johnson and Hill found that the daily injection of bovine anterior pituitary extract (alkaline, later neutralized and filtered) into twenty-one female and fourteen male albino mice produced an increase in growth over that of eleven control females and fourteen control males, which were injected with physiologic solution of sodium chloride. This increase was more marked in the females than in the males. The extract produced a marked increase in the size of the ovaries after the age of 55 days through excessive lutein body formation and persistence. Only one experimental female had a normal ovary with the few corpora lutea associated with normal function, and this was a pregnant animal. Increased lutein formation was associated with a high degree of sterility, but apparently also with an excess number of tubal ova. None of the control females had an excessive number of corpora lutea. In the injected male mice, seven showed a hardening of the testicular wall. Some showed an increase in interstitial tissue and there was some destruction of seminal epithelium. Excess colloid was formed in some of the Cowper's glands. The experimental male mice showed a high degree of sterility compared to the normal males.

Journal of Allergy, St. Louis

2: 73-136 (Jan.) 1931

Importance of Food Sensitization in Allergic Rhinitis. G. Piness and H. Miller, Los Angeles.—p. 73.
Food Anaphylaxis. C. Richet, jr., Paris.—p. 76.
Pollen and Pollen Extracts: V. Skin Reactions to Pollen Fractions. M. B. Moore, H. W. Cromwell and E. E. Moore, Indianapolis.—p. 85.
Elimination Diets for Diagnosis and Treatment of Food Allergy. A. H. Rowe, Oakland, Calif.—p. 92.
*Allergic Headache. C. H. Eyermann, St. Louis.—p. 106.
*Skin Tests to Foods in Asthma. F. M. Rackemann, Boston.—p. 113.
*Allergic Dermatitis. C. M. Stroud, St. Louis.—p. 118.
Angioneurotic Edema: Unusual Manifestations. W. T. Vaughan and E. K. Hawke, Richmond, Va.—p. 125.

Allergic Headache.—Until more knowledge is obtained regarding migraine and further clinical studies are made of the type of headache induced by the ingestion of specific food, it is suggested by Eyermann that the term "allergic headache,"

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rather than "allergic migraine," be employed to describe this condition. It is suggested that either increased intracranial pressure or cerebral edema may be the pathologic causation and that in some instances the condition may be analogous to, or a manifestation of, angioneurotic edema.

Skin Tests to Foods in Asthma.—Skin tests to foods made by Rackemann in a series of 595 patients gave positive results in 32.3 per cent of the 207 children and 21.8 per cent of the total. Foods which reacted most commonly were wheat and eggs. Positive tests to foods may or may not be of clinical importance, as shown by illustrative cases. Despite a negative skin test, specific food sensitiveness may exist.

Allergic Dermatitis.—Success in the treatment of allergic dermatitis, Stroud says, is proportionate to knowledge of the causative factors. In a series of fifty cases, positive skin reactions occurred in twenty-four. With institution of antiallergic measures, eight patients were relieved and thirty-two were improved.

Journal of Lab. & Clinical Medicine, St. Louis

16: 329-436 (Jan.) 1931

Paths of Absorption and Excretion of Sodium Tetraiodophenolphthalein. A. J. Delario, New York.—p. 329.
Effect of Calcium Precipitating Substances on Ciliated Epithelium of Maxillary Sinus. W. F. Wenner, St. Louis.—p. 341.
*Paroxysmal Hemoglobinuria: Case. O. Swineford, Jr., University, Pa.—p. 347.
Effects of Amytal Anesthesia. J. M. D. Olmsted and G. Giragossintz, Oakland, Calif.—p. 354.
Leukocytic Reaction to Injections of Nonspecific Protein. R. L. Larsen and A. A. Janson, Evanston, Ill.—p. 362.
Influence of Anticlotting Agents on Transplantation and Growth of Tumor Tissue. A. Goerner, Long Island, N. Y.—p. 369.
*Fatal Anaphylaxis in Man. W. M. Sheppe, Wheeling, W. Va.—p. 372.
Ringworm of Feet: Value of Microscopic Examinations. H. S. Paynter and C. White, Chicago.—p. 380.
Further Experiences with Simplified Technic for Hepatectomy. S. Soskin, Toronto.—p. 382.
*Schilling Index in Appendicitis. R. H. Goodale and M. E. Manning, Worcester, Mass.—p. 386.
Method for Germicidal Assay of Soaps. H. C. Hamilton and F. Thistlethwaite, Detroit.—p. 391.
Culture of B. Morganii No. 1 Isolated from a Parrot. M. B. Coleman, Albany.—p. 396.
*Microscopic Slide Precipitation Test for Syphilis with Spinal Fluid. R. S. Kline and C. R. Rein, Cleveland.—p. 398.
*Slide Method of Titrating Blood-Grouping Sera. A. F. Coca, New York.—p. 405.
Mechanical Staining Device. G. L. Rohdenburg, New York.—p. 408.
Determination of *pH* of Phosphate Buffer Solutions by Means of Antimony-Antimony Oxide Electrode. R. J. Fosbinder, Philadelphia.—p. 411.
Chart for Computation of Daily Basal Metabolism and Percentile Basal Metabolic Rate from Spirometer Data. C. Bruen, New York.—p. 415.
Further Modification of Varney Anaerobic Jar. L. R. Anderson, Baltimore.—p. 419.
Microscopic Diagnosis of Acid-Fast Organisms. R. L. Barnhart and F. E. Eberson, San Francisco.—p. 421.
Dust Shield on Still for Intravenous Solutions. R. B. Stout, Madison, Wis.—p. 422.

Paroxysmal Hemoglobinuria.—A case of paroxysmal hemoglobinuria is reported by Swineford. He wonders whether an appreciable number of anemias of late syphilis may not be due to unrecognized abortive, subhemoglobinuric attacks of paroxysmal hemoglobinuria.

Fatal Anaphylaxis in Man.—A case of sudden death following the injection of foreign protein is reported by Sheppe with complete postmortem observations. It is offered as an example of true fatal anaphylaxis of the bronchospastic type in man. Fifteen other cases coming to necropsy are analyzed. Evidence is offered to show that thirteen of these cases were probably examples of true anaphylaxis in man. In each of the thirteen instances death occurred either from bronchospasm or splanchnic dilatation. The theory is advanced that an entirely different mechanism (possibly thymicolymphatic) is responsible for postinjection deaths not exhibiting bronchospasm or splanchnic dilatation at necropsy. It is urged that all fatalities from injection of serum be subjected to necropsy for (*a*) elimination of other and unsuspected causes of death, (*b*) recording of careful observations relative to the condition of the pulmonary, thymicolymphatic and splanchnic systems, and (*c*) accurate classification of type of reaction based on anatomic observations.

Schilling Index in Appendicitis.—The Schilling index, white count and microscopic observations were noted by Goodale and Manning in forty appendectomies; ten appendixes were acutely inflamed. There was a definite shift to the left or an increase in young forms of the neutrophils in the acutely inflamed appendixes. The remaining appendixes showing no acute pathologic changes had little or no increase in young forms despite an increase in several of the white counts. The white counts and total percentage of neutrophils do not always run parallel with the infection in the appendix. In view of these observations they believe that the Schilling index in addition to the white count renders a more accurate picture of the pathologic condition of the appendix than the white count with the ordinary differential.

Microscopic Slide Precipitation Test for Syphilis with Spinal Fluid.—The microscopic slide precipitation test for syphilis with spinal fluid described by Kline and Rein is said to be more sensitive than the Wassermann test with the same antigen and much simpler in detail, requiring no titrated hemolytic system of cells, amboceptor and complement. Furthermore, it requires no concentration of the globulins of the spinal fluid, it is performed with antigen emulsions that are satisfactory for use for twenty-four hours, and the results of the reaction magnified about 120 times by the microscope are read accurately with ease.

Slide Method of Titrating Blood-Grouping Serums.—A convenient method of titration of iso-agglutinating serums is described by Coca with which the highest titered serums may be selected as test serums for grouping purpose. A standard of agglutinating power is laid down for such selection. The grouping serums offered to the profession by three reputable commercial biologic houses have been examined and all of them were found to fall below the standard, most of them being quite unsuitable for grouping purposes.

Journal of Urology, Baltimore

25: 1-116 (Jan.) 1931

Urologic Nomenclature. M. L. Boyd, Atlanta, Ga.—p. 1.
Anomalous Renal Rotation and Associated Anomalies. W. F. Braasch, Rochester, Minn.—p. 9.
Renal Complications of Prostatism. N. P. Rathbun, Brooklyn.—p. 23.
Unusual Duplication of Renal Pelvis. H. C. Bumpus, Jr., Rochester, Minn.—p. 39.
Calculous Pyonephrosis in Carcinomatous Horseshoe Kidney. D. R. Melen and I. Gaspar, New York.—p. 43.
Vegetative Syphiloma of Bladder. L. F. Ajamil, Havana, Cuba.—p. 53.
Arterial Valves in Penile Arteries. E. W. Hirsch, Chicago.—p. 61.
Gonorrheal Urethritis in Male Children: Sexual Impulses. L. M. Beilin, Chicago.—p. 69.
Para-Urethritis. S. J. Silbar, Milwaukee, Wis.—p. 85.
Leiomyoma of Prostate. I. J. Wolman, Philadelphia.—p. 93.
Nonoperative Treatment of Prolapse of Urethra. G. R. Livermore, Memphis, Tenn.—p. 99.
Deep Urethrorectal Fistula Following Suprapubic Prostatectomy, Cured by Three-Stage Operation. R. C. Graves, Boston.—p. 101.
Ureteral Catheterization. R. L. Schulz, Los Angeles.—p. 107.
Grounding in Cystoscope Lighting Devices. D. M. Davis and J. B. Whitehead, Baltimore.—p. 111.

Laryngoscope, St. Louis

41: 1-79 (Jan.) 1931

Importance of General Medicine in Practice of Otology. D. H. Walker, Boston.—p. 1.
Acute Suppurative Otitis Media. E. R. Roberts, Bridgeport, Conn.—p. 7.
Otitic Pyemia Without Sinus Thrombosis Following Rupture of Right Tympanic Membrane. T. E. Beyer, Denver.—p. 11.
Simultaneous Meningitis and Surgical Mastoiditis: Surgical Dilemma; Recovery. V. Dabney, Washington, D. C.—p. 14.
Radium Seed in Ethmoid. R. Kramer, New York.—p. 17.
Recovery of Acute Osteomyelitis of Skull Following Operation on Frontal Sinus. J. F. Friesen, Los Angeles.—p. 19.
Observations in More Than 100 External Ethmofrontal Operations. W. L. Simpson and S. H. Sanders, Memphis.—p. 23.
Diagnosis of Laryngeal Conditions. D. H. Jones, New York.—p. 29.
Paralysis of Superior Laryngeal Nerve as Result of Cerebral Hemorrhage. F. S. Mainzer, Clearfield, Pa.—p. 33.
Dysphagia of Septic Origin Resembling Foreign Body in Esophagus. W. B. Chamberlin, Cleveland.—p. 36.
Routine Suction Cleansure of Tonsils Prior to Tonsillectomy. J. B. H. Waring, Cincinnati.—p. 39.
Dermatoses on Mucous Membranes—Diagnosis: Case of Primary Pemphigus of Throat. B. Katz, Los Angeles.—p. 44.
Neuralgias of Head. S. Brock, New York.—p. 48.

Maine Medical Journal, Portland

22: 1-16 (Jan.) 1931

Aortic Aneurysm. E. H. Drake and J. R. Hamel, Portland.—p. 2.
Traumatic Head Injuries. E. H. Risley, Waterville.—p. 6.
Congenital Pyloric Stenosis. C. H. Burgess, Bangor.—p. 9.

Minnesota Medicine, St. Paul

14: 1-112 (Jan.) 1931

*Bacteriology of Acute Rheumatic Fever: Experimental Basis in Animals for Vaccine Therapy. B. J. Clawson, Minneapolis.—p. 1.
*Rheumatic Fever in Childhood. H. F. Helmholz, Rochester.—p. 5.
Rheumatic Carditis. M. H. Hoffman, St. Paul.—p. 8.
Protean Pathologic Manifestations of Rheumatic Fever. E. L. Gardner, Minneapolis.—p. 12.
Nonarticular Forms of Rheumatic Fever. H. Oerting, St. Paul.—p. 14.
*Acute Bowel Obstruction. O. H. Wangensteen, Minneapolis.—p. 16.
Fractures of Pelvis: Nineteen Cases. O. W. Parker, Ely.—p. 29.
*Serotherapy of Measles and Poliomyelitis. C. A. Stewart and E. S. Platou, Minneapolis.—p. 42.
Immunology of Diphtheria and Scarlet Fever. W. R. Shannon, St. Paul.—p. 47.
Cerebrospinal Meningitis. C. O. Kohlbry, Duluth.—p. 54.
*Diffuse Subcortical Sclerosis of Brain. J. C. McKinley, Minneapolis.—p. 62.
Localized Actinomycosis: Five Cases. H. B. Zimmermann, St. Paul.—p. 75.
Bilateral Spontaneous Pneumothorax: Case. J. G. Lamont, Nopeming.—p. 80.
Subacute Bacterial Endocarditis Involving Tricuspid Valve Only: Case. H. Oerting, St. Paul.—p. 82.

Acute Rheumatic Fever.—Clawson states that streptococcic rheumatoid lesions in animals made hypersensitive to streptococci can be prevented by intravenous vaccination. He suggests that this method of vaccination may be indicated in patients with acute rheumatic fever, since such patients are hypersensitive to streptococci.

Rheumatic Fever in Childhood.—Helmholz stresses the fact that rheumatic fever in childhood may be monosymptomatic or may show a few or all of the manifestations of the so-called rheumatic cycle. Complicating disorders of the heart are common and constitute the serious danger of the infection. He urges that all patients with rheumatic fever should have foci of infection removed and should be given a period of from one to two months of restricted regimen. Patients with carditis or chorea should be kept at absolute rest for periods of from six months to a year, after which the normal mode of life may be resumed gradually.

Acute Bowel Obstruction.—Wangensteen would label textbook descriptions of intestinal obstruction Antemortem Signs of the Disease. They do not indicate interference with the continuity of the intestinal lumen but herald impending dissolution. Regurgitant vomiting and distention must cease to be criteria awaited before a diagnosis can be made. Collapse in simple bowel obstruction should be relegated to the delineation of that antemortem status in which all vital functions rapidly depreciate and from which escape or resuscitation is unlikely. Intermittent crampy pain, accompanied by nausea and considerable vomiting without abdominal rigidity or tenderness, is strongly suggestive of an acute block in the continuity of the intestine. The detection of loud intestinal noises on auscultation of the abdomen, and the roentgen visualization of gas in the small intestine, lend sufficient proof to make the diagnosis. The continuance of colicky pain despite the return of gas and feces on the administration of enemas constitutes sufficient indication for immediate operative intervention.

Serotherapy of Measles and Poliomyelitis.—When dealing with poliomyelitis, the therapeutic administration of convalescent human serum, preferably in the preparalytic stage of the disease, is recommended by Stewart and Platou. For this purpose they give from 20 to 30 cc. intraspinally together with 50 to 75 cc. intravenously. Furthermore, they do not hesitate to administer the serum after paralysis occurs, attempting thereby either to prevent a further extension of the paralysis or to promote as complete a recovery as possible. In the presence of severe epidemics, convalescent serum may be used to afford passive protection to exposed children, 10 cc. being given subcutaneously to young children and double that amount to older patients. A repetition of the injection at the end of from four to six weeks is suggested should the epidemic outbreak continue in severity for several weeks.

Diffuse Subcortical Sclerosis of Brain.—A case of diffuse subcortical sclerosis of the familial type is presented by McKinley clinically and pathologically. The case reports from the recent literature of this and allied conditions are summarized. The confusion of classification and terminology is pointed out. A simple classification is suggested as follows: The term diffuse subcortical sclerosis is a satisfactory designation for the general group. The subgroups are: (1) inflammatory type; (2) familial-hereditary type; (3) primary or sporadic type.

New England Journal of Medicine, Boston

204: 143-190 (Jan. 22) 1931

Atelectasis. C. R. Metcalf, Concord, N. H.—p. 143.
Stillbirths and Neonatal Deaths in Boston, 1929. H. C. Stuart, Boston.—p. 149.
*Salyrgan as Diuretic: Sixty Cases. H. B. Sprague and A. Graybiel, Boston.—p. 154.
Crossed Circulation Experiments. W. M. Firor, Baltimore.—p. 157.
New Type of Heated Cradle. H. H. Faxon, Boston.—p. 160.
Progress in Diagnosis and Treatment of Syphilis, 1929. A. W. Cheever, Boston.—p. 161.

204: 191-242 (Jan. 29) 1931

Surgery in Treatment of Peptic Ulcer. A. J. Sullivan, New Haven, Conn.—p. 191.
Differential Diagnosis of Subacute Bacterial Heart Disease and Banti's Disease: Case. W. D. Reid, Boston.—p. 198.
Diagnosis of Pregnancy by Aschheim-Zondek Test. H. S. Finkel, Boston.—p. 203.
Falling Birth Rate. G. H. Bigelow and A. D. Hamblen, Boston.—p. 209.
Are Vitamin D and Irradiated Ergosterol Identical? A. D. Holmes, Stoneham.—p. 211.
Perforation of Intestine by Fishbone. T. S. Bacon and P. G. Corliss, Springfield.—p. 214.

Mersalyl as a Diuretic: Sixty Cases.—Sixty cases in which treatment with mersalyl was used are reported by Sprague and Graybiel. Forty-six patients had cardiac disease with congestive failure; eight had cirrhosis of the liver; four had cancer; and one each had nephrosis and an ovarian cyst. In spite of the fact that one third of these patients were in the terminal stages of chronic disease, diuresis was secured by the use of mersalyl in 80 per cent. This diuresis exceeded twice the fluid intake in 55 per cent of the cases. Toxic effects from mersalyl are very rare and consist of mild renal, gastro-intestinal or skin irritation. The only complication of importance in this series was in one patient who had cellulitis of the arm and thrombosis of the vein into which the drug was given. The authors confirm the opinion of other observers that the drug is an active and safe diuretic, of particular value in the treatment of congestive heart failure with edema, of ascites from various causes, and of nephrosis. In some cases it may be useful in treating malignant effusions. It should be used early in the therapy of these conditions and not reserved as a drug of last resort. As a diuretic for repeated use it is useful in its freedom from serious toxicity and almost complete absence of gastro-intestinal irritation. Its effectiveness can often be increased by combining it with acid salts, such as ammonium chloride or nitrate, or with other diuretics and digitalis.

New Jersey Medical Society Journal, Orange

28: 1-84 (Jan.) 1931

Duodenal Stasis. C. F. Baker, Newark.—p. 1.
What is Wrong with Fracture Situation. J. K. Adams, East Orange.—p. 3.
Relation of Traumatic Surgery to Industry. J. W. Martin, Baltimore, Md.—p. 6.
Gastro-Intestinal Disorders in Relation to Defective Gastro-Intestinal Mechanics. C. G. Kerley, New York.—p. 14.
Changes in Human Rickets After Viosterol Therapy. J. Caffey, New York.—p. 21.
Oddities in Acute Mastoid Disease. W. L. Pannell, East Orange.—p. 22.
Tonsillectomy Under Local Anesthesia. R. H. Fowler, New York.—p. 27.
Advantages of General Anesthesia in Tonsillectomy. W. Campbell, East Orange.—p. 29.
Obstetric Mortality. J. C. Hartman, Germantown, Pa.—p. 31.
Problems in Medical Ethics. H. H. Bowles, Summit.—p. 35.
Bacteriologic Study of Chronic Infectious Arthritis. J. W. Gray and C. H. Gowen, Newark.—p. 38.

Yale Journal of Biology & Medicine, New Haven

3: 107-201 (Dec.) 1930

Relations of Diet to Fat Deposition in Body. L. B. Mendel and W. E. Anderson, New Haven.—p. 107.
Localized Collapse of Lung by Means of Extrapleural Balloon. A. W. Oughterson and S. C. Harvey, New Haven.—p. 139.
Disciplines. H. S. Burr, New Haven.—p. 151.
Epiphysitis of Anterior Superior Iliac Spine. J. T. Carmody, New Haven.—p. 159.
Hernia Through Esophageal Opening of Diaphragm: Case of Right-Sided Hernia. W. A. Lafield, New Haven.—p. 165.
Blood Picture of Normal Laboratory Animals: Guinea-Pig. R. A. Scarborough, San Francisco.—p. 169.

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FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Indian Medical Gazette, Calcutta

66: 1-60 (Jan.) 1931

*Clinical Studies in Malaria by Cultural and Enumerative Methods. R. Knowles and B. M. Das Gupta.—p. 1.
Diagnosis of Lymphatic Obstruction of Filarial Origin. H. W. Acton and S. S. Rao.—p. 14.
Rat-Guards for Ships' Hawsers. C. L. Bilderbeck, W. O. A. Young and F. H. Otto.—p. 17.

Malaria.—Knowles and Das Gupta give details of fifteen cases of benign tertian or of malignant tertian malaria, admitted to the hospital, and studied by cultural and enumerative methods. In Bengal, few cases of acute primary malarial infection are seen. Most patients when admitted have had the disease for a month or more and show chronic and "residual" infections only. The series, however, illustrates the tendency of infection with *Plasmodium vivax* to produce a chronic disease associated with relapses and, on the other hand, the marked tendency to spontaneous cure in infections with *P. falciparum*. The mechanism of spontaneous cure in malaria is probably associated with the production of lysins in the plasma; with phagocytosis of the merozoites by polymorphonuclear and large hyaline leukocytes, and with the activity of the reticulo-endothelial system. In Bengal, *P. falciparum* infections during September appear to be more closely associated with a large output of gametocytes than do infections in July and August. In "residual" and convalescent cases of malignant tertian malaria the administration of quinine has the paradoxical effect of greatly increasing the number of crescents in the peripheral blood stream. The administration of a total dose of 0.06 Gm. of plasmochin in six days is sufficient to exterminate the gametocytes of *P. falciparum* from the peripheral blood stream. A suggested standard treatment for malaria is outlined. In this, 13 Gm. of quinine is administered in solution in ten days, together with alkalis; and 0.01 Gm. of plasmochin daily for the last six days of treatment.

Journal of Oriental Medicine, Dairen

14: 1-7 (Jan.) 1931

Biochemical Studies of Hydrocyanic Acid: Influence on Blood Catalase. F. Kudo.—p. 1.
Influence of Nucleic Acid Salt on Agglutination of Blood. K. Matsuoka. —p. 1.
Metabolism of Potassium Sulphocyanate. F. Kudo.—p. 2.
Reproduction of Injected Sulphocyanic Potassium in Aqueous Humor of Body. F. Kudo.—p. 3.
*Mechanism of Formation of Rhodan in Body and Region of Formation: Cells of Liver Forming Rhodan. K. Sato.—p. 4.
Colloidal Character of Serum of Four Types Viewed from Iso-Agglutination. N. Mochizuki.—p. 5.
Comparative Study of Therapeutic Results of Streptococcus Vaccine and Coctigen in Erysipelas. H. Ito and B. Sawada.—p. 6.
*Strength of Immune Body in Artery and Vein, and Mechanism of Causing Difference in Strength. B. Masuse.—p. 7.

Formation of Rhodan in Body and Region of Formation.—Sato describes experiments which proved that the stellate and parenchymal cells of the liver have the function of forming rhodan. The blood of a dog the function of whose liver had been disturbed by sealing of the stellate cells with india ink and by intoxication of the parenchymal cells with carbon tetrachloride and phosphorus and by ligature of the ductus choledochus showed a marked decrease of rhodan after an injection of ethyl cyanide. The stellate and parenchymal cells of the liver of a dog have the function to transform ethyl cyanide into rhodan. A part of the rhodan formed in the liver of a dog is excreted into the bile by means of the stellate and parenchymal cells.

Strength of Immune Body in Artery and Vein.—Mitsuse found that there is a substance of complement fixation reactive to the lipoid antigen which is generally used in the Wassermann test, in addition to a specific immune body against cholera bacilli, in the serum of rabbits immunized by cholera bacilli mixed with horse or cow serum. Thus the author tested the difference in the strength of the antibody of the serum in the artery and vein of the animals immunized with the serum. The serum of an artery was slightly more powerful than that of a vein. The immunizing reaction of the serum of a vein was made slightly more powerful by an irrigation of oxygen. The immunizing reaction of an artery was made slightly less powerful by an irrigation of carbonic acid. Therefore the difference in the action of the immune body of the serum of an immunized animal is due to the difference in the contents of oxygen and carbon dioxide.

Journal of Physiology, London

71: 1-120 (Jan.) 1931

Action of Drugs on Vascular and Muscular Factors Controlling Intra-Ocular Pressure. J. Calle, P. M. Duke-Elder and W. S. Duke-Elder. —p. 1.
Possible Nervous Mechanism Involved in Liberation of Histamine. R. G. MacGregor and S. Peat.—p. 31.
Induction of Ovulation in Hypophysectomized Rabbit by Administration of Anterior Lobe Extracts. M. Hill and A. S. Parkes.—p. 36.
Action of Ovulation-Producing Substance of Urine of Pregnancy on Hypophysectomized Rabbit. M. Hill and A. S. Parkes.—p. 40.
Adaptations of Organism to Changes in Oxygen Pressure. D. B. Dill, H. T. Edwards, A. Fölling, S. A. Oberg, A. M. Pappenheimer, Jr., and J. H. Talbott.—p. 47.
Response of Single End-Organ. B. H. C. Matthews.—p. 64.
Ultrafiltration in Vivo. A. Geiger.—p. 111.

Journal of State Medicine, London

39: 63-124 (Feb.) 1931

Prevention of Street Accidents. J. A. A. Pickard.—p. 63.
Prevention of Tuberculosis. S. L. Cummins.—p. 83.
Prevention of Venereal Disease. A. Massey.—p. 89.
Care of Blind Child. B. Purse.—p. 98.

Medical Journal of Australia, Sydney

1: 33-66 (Jan. 10) 1931

*Observations on Endometrium and Uterine Hemorrhage. M. G. Sutton. —p. 34.
Intestinal Obstruction Due to Ring Cancer of Rectum. E. M. Fisher. —p. 47.

Endometrium and Uterine Hemorrhage.—Sutton believes that an understanding of the function of menstruation must be based on a knowledge of its comparative and its intrinsic physiology, together with the histology of the cyclic changes in the ovary and the endometrium. Except in the case of bleeding due to retained products, fibroid polypi and carcinoma of the body, irregular uterine bleeding is extra-uterine in origin, and often extrapelvic; to the latter class belong the metropathies. Chronic metritis is an infrequent condition associated with chronic interstitial endometritis, the late result of which is true fibrosis uteri. Paraclimacteric fibrosis is only a relative condition and not inflammatory in origin. So-called chronic subinvolution is apparently a misconception; it should be termed "the parous uterus." None of these conditions usually cause uterine bleeding. They may aggravate or prolong it. Endometritis does not exist except as a transitory condition in the course of an acute severe uteropelvic infection. Before the menopause the uterus is not an organ to be lightly dispensed with, because, quite apart from its gestational function, it is lined with a complex and ever changing glandular structure possibly possessing, besides an endocrine function, a function relating to calcium economy in the female organism; on this account, when it is subject to hemorrhage not due to malignant growths or large fibroids, due consideration must be given to such procedures as partial hysterectomy or myomectomy with ovarian conservation and roentgen irradiation of the thyroid, pituitary body and spleen. If these procedures fail, the less ideal destruction of the endometrium by radium or surgical diathermy may be practiced.

Practitioner, London

126: 193-288 (Feb.) 1931

Modern Treatment of Syphilis. L. W. Harrison.—p. 193.
Clinical Study of Latent Syphilis. G. Evans.—p. 205.
Problem of Gonorrhea in General Practice. E. R. T. Clarkson.—p. 220.
Relief of Retention. K. M. Walker.—p. 240.
Sexual Anomalies and Perversions. H. J. Norman.—p. 251.
Place of Roentgen Rays in Treatment of Malignant Disease: Cancer of Breast. F. Hernaman-Johnson.—p. 259.
Ambulatory Method for Treatment of Gastric Ulcer. N. Hypher. —p. 272.
Myxedema Mistaken for Encephalitis Lethargica. H. C. Barlow. —p. 278.

China Medical Journal, Shanghai

45: 1-100 (Jan.) 1931

Symposium on Kala-Azar. E. B. Struthers, S. E. Bethell, W. H. Turner, L. S. Morgan, J. B. Woods, Sr., L. N. Bell, T. M. Yates, A. A. McFadyen and H. W. Y. Taylor.—p. 1.
Paragonimiasis in China. J. L. Maxwell.—p. 43.
Continuous Intravenous Infusion. A. H. Skinner.—p. 49.
Pancreatic Stone. P. D. Choy and H. Y. Oh.—p. 54.

Annales de l'Institut Pasteur, Paris

45: 673-814 (Dec.) 1930

Forms of Ultravirus Provoking Neurotropic Ectodermatoses. C. Levaditi. —p. 673.
Passive Immunity Obtained with Type III Pneumococcus. L. Cotoni and N. Chambrin.—p. 708.
*B C G Vaccination and Vernes' Resorcinol Reaction. V. Grysez and A. Breton.—p. 727.
*Influence of Injections of B C G on Animals Infected with Virulent Tuberculosis. I. Levitan, D. Lokhoff and V. Kosmodemianski.—p. 740.
Immunity in Experimental Plague. A. Compton.—p. 754.
Undulant Fever in Azerbaidjan: Brucella Melitensis-Abortus Group. P. Zdrodowski, H. Brenn and B. Voskressenski.—p. 768.

B C G Vaccination and Vernes' Resorcinol Reaction.—By means of experiments on guinea-pigs and observations of children, Grysez and Breton ascertained that vaccination with B C G does not cause an augmentation of the optic index of the Vernes resorcinol reaction; in fact the optic index rarely exceeds 44 in animals inoculated with B C G and remains below 30 in vaccinated children. Since tuberculin and other tests produce the same reaction in persons vaccinated with B C G as in tuberculous patients, the Vernes test gives valuable aid in distinguishing between banal complications arising from the vaccination itself and actual symptoms of tuberculous infection.

Injections of B C G in Animals Infected with Virulent Tuberculosis.—Levitan et al. performed a series of experiments on guinea-pigs, rabbits and monkeys in order to observe the effects of vaccination with B C G on animals inoculated experimentally with tubercle bacilli. While the B C G vaccination proved harmless, they noted practically no difference between the condition of the vaccinated animals and the nonvaccinated controls. The guinea-pigs and rabbits that had been vaccinated generally lived longer, and the tuberculous process seemed to take on a fibrous character, particularly in the lymph nodes and in the liver. In some of the tuberculous guinea-pigs that were vaccinated, apathy and a slight elevation of temperature were noted after inoculation; the rabbits did not present any reaction of this nature; the monkeys had chills, poor appetite and apathy for several days.

Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris

(54): 1803-1875 (Dec. 22) 1930

*Severe and Fatal Accidents Following Administration of Acriflavine Hydrochloride. R. Bénard and M. Tassin.—p. 1804.
*Aqueous Extract of Spleen in Treatment of Pruritus and Eczema. P. Chevallier and L. Bloch.—p. 1814.
Action of Aqueous Splenic Extract on Eosinophilia of Blood. P. Chevallier and Z. Ely.—p. 1819.
Tuberculosis: Treatment with Gold, Cerium, Lanthanum and Molybdenum. C. Flandin, L. Lecoq, Maison and P. L. Thiroloix.—p. 1823.
Soaps of Heavy Metals in Treatment of Syphilis and Tuberculosis. M. Renaud.—p. 1832.
Case of Postseroth erapeutic Radial Neuritis. M. Labbé, R. Boulin, E. Azérad and P. Soulié.—p. 1840.
*Treatment of Severe Forms of Progressive Chronic Deforming Rheumatism by Parathyroid Extract. R. J. Weissenbach, F. Françon, L. Perlès and P. Seidmann.—p. 1843.
Case of Multiple Sclerosis Treated by Hemolytic Serotherapy. Laignel-Lavastine and N. T. Koressios.—p. 1854.
Permanent Hypotension, Acrocyanosis and Cardioarterial Aplasia. E. Doumer.—p. 1865.

Accidents Following Administration of Acriflavine Hydrochloride.—Bénard and Tassin report a case of prolonged subacute malignant endocarditis in which one injection of 0.2 Gm. of acriflavine hydrochloride produced a condition of acute hepatic insufficiency with manifestations of cutaneous and visceral purpura; the patient died three and a half days later. They also review the literature dealing with the effects of the acriflavine hydrochloride treatment and find that most authors, even though they testify to the innocuousness of this product, cite one or more cases in which dangerous symptoms were observed after the injections, the most common manifestations being nausea, vomiting, chills, jaundice, insomnia, fever, cutireactions and dysphagia. The authors do not recommend discontinuing the use of acriflavine hydrochloride, but they feel that the fact that so many different symptoms have resulted from its use in different cases warrants careful attention to the problem in order to ascertain the cause of these reactions, which seem to bear no relation to the quality of the medicament or to the size of the dose administered.

Aqueous Extract of Spleen in Treatment of Pruritus and Eczema.—Chevallier and Bloch report several cases that demonstrate the excellent results they have secured during the past year by using aqueous splenic extract in the treatment of pruritus and eczema. The extract used corresponds to 12.5 Gm. of fresh veal spleen per cubic centimeter. It is given in subcutaneous injection. At first the authors injected 2 cc. of the extract every two days. Later they gave doses of 4 cc. every two days. The larger doses in some cases cause a slight fever and general feeling of discomfort. The results of the treatment have never been unpleasant, however, and the fact that neither diet nor local cutaneous treatment is necessary makes the splenic extract treatment an important therapeutic development.

Treatment of Progressive Chronic Deforming Rheumatism by Parathyroid Extract.—Weissenbach et al. report a case of progressive chronic deforming rheumatism in which subcutaneous injections of parathyroid extract were used with good results. They have used this treatment successfully in about ten cases. The immediate results of the treatment, which manifest themselves after the first few injections, consist of articular flexibility, increased facility of movement, and a feeling of well being. The amelioration appears in from twenty to thirty minutes after the injection, lasts for about twelve hours and then disappears. The authors point out that this temporary amelioration, which often permits a patient to resume an apparently normal life, is similar to the effects of insulin in diabetes. The late and cumulative effects of the injections of parathyroid extract are also noteworthy; continued use of the treatment tends to relieve permanently the stiffness of the joints and to permit greater ease of movement. While the treatment is, of course, useless in cases of extreme cachexia and deformity, it is valuable in long standing cases like the one reported in which the patients are confined to their beds and almost helpless. The exact mechanism of the therapeutic effects of the parathyroid extract is not yet known. Since the treatment is so simple, however, and involves no risk if the patient is given careful attention, the authors recommend its use in refractory cases.

Bulletins et Mém. de la Soc. Nat. de Chirurgie, Paris

56: 1355-1413 (Dec. 13) 1930

Pulmonary Abscess: Surgical Treatment: Seven Cases. R. Fontaine. —p. 1356.
*Resection as Means of Avoiding Pulmonary Complications in Gastric Surgery. V. Delagenière.—p. 1376.
Case of Köhler's Disease in Region of Semilunar Bone. P. Masini.—p. 1382.
Resection of Knee for White Tumor. M. Mauclaire.—p. 1386.
Late Reestablishment of Intestinal Continuity by Invagination After Rectosigmoidal Resection. G. Jean.—p. 1392.
Technic of Continent Cholecystostomy by Invagination. B. Desplas and J. Meillère.—p. 1395.

Resection as Means of Avoiding Pulmonary Complications in Gastric Surgery.—Delagenière reports twenty-six cases of gastric surgery in which resection was employed; there was only one death, which was caused by an embolism. He also gives the results of ten cases in which a simple gastroenterostomy was used and which resulted in three cases of pulmonary complications, two of which were fatal. The author attributes the efficacy of resection in preventing pulmonary complications to the total suppression *en masse* of the seat of infection.

Paris Médical

1: 1-32 (Jan. 3) 1931

Tuberculosis: Annual Review. P. Lereboullet and M. Lelong.—p. 1.
*Comparative Value of Mendel's and Pirquet's Tests in Nurslings. L. Bernard and M. Lamy.—p. 12.
Technic and Indications for Subcutaneous Vaccination with B C G. B. Weill-Hallé.—p. 15.
Importance of Determining Presence of Tubercle Bacilli in Gastric Contents in Diagnosis of Pulmonary Tuberculosis in Nurslings. P. F. Armand-Delille.—p. 18.
Prognosis of Tuberculosis in Nurslings. M. Lelong.—p. 20.
Complementary Treatment in Artificial Pneumothorax. A. Jacquelin and J. P. Demaldent.—p. 24.
Evolution of Pulmonary Cavern Revealed Only by Roentgen Examination. C. Mantoux.—p. 30.

Comparative Value of Mendel's and Pirquet's Tests in Nurslings.—Because of the recent attacks made on the reliability of Mendel's intradermo test, Bernard and Lamy used both it and Pirquet's test in the examination of 200 nurslings. The results of the two tests proved to be identical in every case. The intradermo reaction was more pronounced than the cutireaction, and in the case of infants who entered the hospital

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during the anteallergic period the intradermo reaction usually became positive before the cutireaction. The intradermo reaction is therefore to be recommended for use in critical cases. On the other hand, the greater simplicity of technic of the cutireaction is a distinct advantage. The authors state emphatically, however, that they have not observed any discrepancy between the results of the two methods and that Mendel's test is fully as reliable as Pirquet's.

Presse Médicale, Paris

38: 1641-1656 (Dec. 3) 1930

*Relations Between Contraction of Aponeurosis of Palm and Hypocalcemia and Parathyroidal Insufficiency. R. Leriche and A. Jung.—p. 1641.
Osteosynthesis: Fractures of Upper Extremity of Femur. A. Lambotte. —p. 1642.

Contraction of Aponeurosis of Palm and Hypocalcemia and Parathyroidal Insufficiency.—Impressed by the rather poorly defined but unmistakable relations that seem to exist between the condition of various ligaments and modifications of calcemia, Leriche and Jung determined the calcium content of the blood in two patients with aponeurotic contraction of the palm. In both patients hypocalcemia was present. Injections of parathyroid extract-Collip increased the calcemia, enabled the patient to move his fingers more easily and definitely relieved the contraction of the aponeurosis. In view of the facts already established concerning the role played by the parathyroids in relating the tonus of the muscles, the authors consider the results in these two cases of sufficient significance to suggest that disturbances of parathyroidal secretion may be either a possible or a habitual cause of Dupuytren's contraction.

38: 1657-1672 (Dec. 6) 1930

Anatomy and Pathogenesis of New Variety of Extradural Radiculomedullary Compression: Fibrocartilaginous Nodule of Posterior Face of Intervertebral Disk. T. Alajouanine and D. Petit-Dutaillis.—p. 1657.
*Sodium Chloride Treatment in Intestinal Occlusion Following Laparotomy. V. Bojovitch.—p. 1662.

Sodium Chloride Treatment in Intestinal Occlusion Following Laparotomy.—Bojovitch reports eight cases in which he used intravenous injections of 5 cc. of a 20 per cent solution of sodium chloride to relieve intestinal occlusion following a laparotomy. He has also used this treatment as a preventive measure by giving injections of the solution to laparotomized patients ten hours after the operation and every three hours thereafter until normal emission of gas was produced. The author feels that the excellent results secured, together with the simplicity of the treatment, justify an extensive use of the method. The effect of the solution seems due to its excitation of the nerves and the smooth muscle fibers of the intestine.

Archivio di Ostetricia e Ginecologia, Naples

17: 691-754 (Dec.) 1930

*Certain Unusual Indications for Cesarean Section. G. Fusco.—p. 691.
Solitary Angiomyomas of Uterus. F. Spirito.—p. 704.
*Possible Variation in Iodine Content of Thyroid in Pregnancy and of Fetal Thyroid. G. Romaniello.—p. 716.

Unusual Indications for Cesarean Section.—Fusco, while he admits that his cases are too few to prove anything definitely, is favorable to the view that the indications for cesarean section may well be extended considerably. For the mother, cesarean section may be regarded as not much less favorable than vaginal intervention. For the child, cesarean section is more favorable than the more difficult vaginal operations.

Iodine Content of Thyroid in Pregnancy and of Fetal Thyroid.—Romaniello, on the basis of researches carried out on the thyroids of normal and gravid animals and during and immediately following parturition, and also on the thyroids of young just born or several days old, reaches the conclusion that the iodine content of the thyroid increases nearly always in pregnancy, diminishes rapidly during parturition and immediately afterward, and that in the fetal thyroid the iodine does not begin to be found until a few days after birth.

Policlinico, Rome

37: 557-604 (Dec. 1) 1930. Medical Section

*Simple Method of Calculation to Determine the Quantity of Urea That Should be Excreted to Correspond to a Given Amount of Rest Nitrogen in Blood. U. Speranza.—p. 557.
Sulphur and Glycemia. A. Ricci.—p. 561.
*Quantitative Variations of Lipoids and Their Relations in Blood in Experimental and Clinical Anemias. S. Marino.—p. 566.

The Quantity of Urea Excreted That Corresponds to a Given Amount of Rest Nitrogen in Blood.—Speranza explains his method of calculation that enables him to determine, more exactly than with the Ambard formula, the amount of urea that azotemic kidney patients should eliminate in twenty-four hours in relation to a determined amount of rest nitrogen in the blood and what the deficit of renal functioning is in the elimination of nitrogenous catabolites.

Quantitative Variations of Lipoids and Their Relations in Blood in Anemias.—Marino states that the results secured in the various cases examined are worthy of note since, not only in experimental anemias, induced by means of pyridine and tolylenediamine, but also in clinical anemias, the quantitative variations in the lipoids and in their relations, as encountered in the blood, point to a disturbance, sometimes marked, in the lipoid equilibrium of the blood. He was unable, however, to confirm the importance of the relation of the total cholesterol to the phosphatides in researches on anemias, although some authors have emphasized such importance.

37: 1737-1772 (Dec. 1) 1930. Practical Section

Sodium Citrate in Surgical Practice. M. Atella.—p. 1737.
*Serous Meningitis. R. Gandolfi.—p. 1741.

Serous Meningitis.—Gandolfi describes in detail a case of serous meningitis that had a long course and ended in a clinical recovery but with the grave sequel of total blindness. The author discusses the diagnosis and points out the difficulties that characterized the onset of the disease.

37: 1773-1808 (Dec. 8) 1930. Practical Section

The Bacteriophage. G. Altana.—p. 1769.
*Significance of Pulse During Childbirth. G. Picardi.—p. 1779.

Significance of Pulse During Childbirth.—Picardi found bile salts constantly present in the urine of puerperants, as shown by the Hay test. In some cases the bile salts were present also during the last days of pregnancy, especially at the onset of labor. Urobilin is sometimes present. This involves doubtless a dissociated icterus caused by toxins of probably ovarian origin. The action of the bile salts on the vagus would explain the behavior of the pulse during the puerperium. It is generally recognized that the nature of the pulse offers one of the most important symptoms for the estimation of the way the puerperium is progressing.

37: 577-620 (Dec. 15) 1930. Surgical Section

General Anesthesia with Nitrous Oxide. L. di Natale.—p. 577.
Action of Certain Substances in Ileus Paralyticus. V. Ghiron and S. Scandurra.—p. 579.
Experimental Researches on Pyelovenous Backflow. V. Lozzi and A. Vitale.—p. 588.
*Reno-Ureteral Calculosis Associated with Malformation of Upper Urinary Tract. G. Scollo.—p. 605.

Reno-Ureteral Calculosis Associated with Malformations of Upper Urinary Tract.—Scollo describes an interesting case of reno-ureteral calculosis, exceptional for the number of calculi found (about 200) in a bifid ureter, with congenital dilatation of one of the two ureteral arms and cystic dilatation of its lower end. He emphasizes the difficulty of the diagnosis of ureteral calculi and the primary congenital condition of the encountered ureteral dilatation, and demonstrates the possibility, in opposition to the opinion generally held, that true antiperistaltic movements may develop in the ureter.

Rivista di Clinica Medica, Florence

31: 981-1032 (Sept. 30) 1930

Pulmonary Gangrene: Pneumothorax Treatment. G. Dalla Torre.—p. 981.
*Oculocardiac Reflex and Artificial Pneumothorax. S. Aloigi.—p. 1006.

Oculocardiac Reflex and Artificial Pneumothorax.—Aloigi reports a case in which intense bradycardia followed artificial pneumothorax. He explained the behavior of the pulse of other subjects under the same conditions and tested at the same time their oculocardiac reflex. He could find in most cases no relationship between the oculocardiac reflex and the pleurocardiac reflex. Control of the behavior of the pulse following artificial pneumothorax may have, however, a certain practical value.

Prensa Médica Argentina, Buenos Aires

17: 893-936 (Nov. 30) 1930. Partial Index

Focal Infection: Septic Focus in Tonsil. M. R. Castex.—p. 893.
Lymphoid Tissue Formations in Mucosa of Uterus: Case. J. Llambias and D. Iraeta.—p. 916.
*Syndrome of Intracranial Hypertension of Syphilitic Origin. E. A. Beretervide and E. Delfino.—p. 918.

Intracranial Hypertension of Syphilitic Origin.—Beretervide and Delfino report the case of a boy, aged 13 years, with congenital syphilis, who after an attack of influenza, followed by otitis, presented a clinical picture of about a month's duration, constituted by fever, intense cephalalgia, nausea, pain in the neck, and motor, sensory and visual disturbances, which proved to be caused by intracranial hypertension. There was no cerebral tumor responsible for the intracranial hypertension, which proved to have a syphilitic etiology. Syphilis may attack the nervous system in a gummatous, cystic, meningeal or pseudotumoral form. As the meningeal form was excluded in this case by the negative results of the chemical and biologic tests, any one of the other three forms of syphilis may have caused the condition of the patient. He received nine intramuscular injections of mercuric cyanide. The injections were given, one every other day. The patient recovered and when seen five months later he was still in normal condition. In a review of the literature published during the last six years, the authors found only one case with the same clinical picture and the same characteristics of the cerebrospinal fluid as those observed in their patient. The patient of the previously reported case received antisyphilitic treatment. As the cerebrospinal fluid showed no modifications, the antisyphilitic treatment was discontinued and high voltage roentgen therapy was resorted to. The authors believe that in that case the recovery was credited erroneously to high voltage roentgen therapy. They consider that the intracranial hypertension in both cases (in the case previously reported in the literature and in their case) improved until recovery under the effect of the antisyphilitic treatment.

Revista de la Soc. de Med. Interna, etc., Buenos Aires

6: 431-587 (Oct.-Nov.) 1930. Partial Index

*Chronic Ulcerative Colitis of Gastric Origin. J. Beretervide and C. F. Cárrega Casaffousth.—p. 469.

Chronic Ulcerative Colitis of Gastric Origin.—Beretervide and Cárrega Casaffousth say that, in cases of chronic ulcerative colitis in which the studies made at the laboratory give negative results for infection or parasitism of the patient and in which no toxic factors such as uremia, gout or diabetes are involved, the most probable etiologic factor is the insufficiency of the gastric secretion. In cases of that nature a medication directed to improve the gastric secretion in relation to the individual deficiency gives good results. Achylia gastrica is an important factor in the etiology and pathogenesis of chronic ulcerative colitis. The gastric digestion is imperfectly carried out when the gastric juice is lacking in any of its ferments, which condition by itself may cause the gastrogenic diarrhea. The insufficiency of the gastric secretion may also be responsible for many of the symptoms of the clinical picture of patients with chronic ulcerative colitis, by depriving the intestinal flora of the antiseptic and favorable influence that the gastric secretion has on it. The authors report the case of a woman, aged 35, with a grave dysenteric syndrome of chronic ulcerative colitis, which proved to be related to a condition of marked anachlorhydria of the patient. A treatment directed to increase the amount of hydrochloric acid and pepsin in the gastric juice caused the disappearance of the dysenteric syndrome, with rapid improvement in the general condition of the patient.

Archiv für Gynäkologie, Berlin

143: 201-476 (Dec. 19) 1930

Mouse Test in Evaluation of Solutions of Ovarian Hormone. R. Meyer and H. Wulk.—p. 201.
Genesis of Vaginal Leukorrhea. E. Raab.—p. 220.
*Calcium Content of Blood Serum During Pregnancy, Labor and Puerperium. M. Adler.—p. 236.
*Potassium and Calcium Contents of Blood During Menstrual Cycle. R. Spiegler.—p. 248.
*Modification of Alkali Reserve of Blood by Pregnancy, Labor and Puerperium. J. Malfatti and J. Burtscher.—p. 272.
*Antiglycogen Substance in Blood of Gravidas. K. J. Anselmino and F. Hoffmann.—p. 310.
Iodine Content of Blood in Women Under Physiologic Conditions. W. Scheringer.—p. 319.
Modification of Metamorphosis of Frog Larvae by Blood from Gravida. H. Eufinger, H. Wiesbader and N. Smilovits.—p. 338.
Xanthoprotein Reaction (Becher) in Gravida's Blood from Which Protein Has Been Removed. H. Eufinger.—p. 366.
Immunizing Action of Parenterally Administered Colloidal Sulphur in Gynecologic Infections. G. J. Pfalz.—p. 376.
Carbohydrate Metabolism in Cancer of Uterus Following Roentgen and Radium Irradiation. I. Lucas.—p. 389.
Cerebrospinal Fluid of Women in Health and Disease: Sodium Chloride Content. E. Vogt.—p. 430.
Id.: Hydrogen Ion Concentration. E. Vogt.—p. 434.
Apparent Contraindications Between Clinical and Roentgen Examinations of Pelvis. F. A. Wahl.—p. 438.
Artificial Pregnancy Reaction in Nonpregnant Woman. K. Ehrhardt.—p. 446.
Nonspecificity of Manoilov's Pregnancy Reaction. F. Fretwurst and K. Otto.—p. 459.
Microscopic Changes in Pancreas in Nursling with Diabetes. G. Schretter and H. Nevinny.—p. 465.

Calcium Content of Blood Serum During Pregnancy.—Using the method of Kramer-Tisdall, Adler determined the calcium content of the blood serum of fourteen healthy nonpregnant women, twenty-six healthy gravidas during the various months of pregnancy, five women during labor and twelve during the puerperium. It was found that during pregnancy the calcium content of the blood serum is below normal and that the decrease appears as early as the third month; from the fifth to the ninth months the decrease is uniform. During the tenth month of pregnancy the calcium content of the blood serum is slightly greater than during the preceding month but is still below the normal amount. During labor it increases rapidly to within the lower limits of physiologic variability. The amount of the increase is dependent on the duration of the labor pains. In from twenty-four to forty-eight hours post partum the calcium content of the blood drops to below what it was before labor. It remains subnormal until the eighth day post partum and then rapidly returns to the lower limit of normal.

Potassium and Calcium Contents of Blood During Menstrual Cycle.—Spiegler determined the potassium and calcium contents of the blood in fifty women shortly before the appearance of menstruation, seventy-one during menstruation and eighty-three shortly after its completion. He noted that during the menstrual cycle the potassium content of the blood undergoes a marked alteration. As a rule, it reaches its lowest value during menstruation and then increases progressively in the postmenstrual period to reach its maximum in the premenstrum. The calcium content of the blood serum, on the other hand, is extremely stable and does not show noteworthy changes during the menstrual cycle. The opposite behavior of the potassium and calcium ions results in a marked change in the potassium: calcium ratio.

Modification of Alkali Reserve of Blood by Pregnancy.—According to Malfatti and Burtscher, the decrease in the alkali reserve of the blood that occurs in pregnancy becomes more marked during labor. The decrease is greater in primiparas than in multiparas. During the first three or four days post partum the alkali reserve of the blood increases but it does not reach the normal value. Lactation modifies the carbon dioxide combining power of the blood. This modification is manifested by a decrease in the alkali reserve if the blood is withdrawn at least more than twelve hours after the beginning of lactation; if the blood is withdrawn before this time, the decrease cannot be demonstrated. After the decrease in the alkali reserve of the blood which is produced by lactation, there occurs another increase in the carbon dioxide combining power; even from twelve to twenty-one days post partum the value has not returned to normal. Septic conditions cause a particularly marked decrease in the alkali reserve. In a case of vomiting of pregnancy and a case of nephropathia gravidarum with a high albumin content of the urine the alkali reserve was decreased below the normal for healthy gravidas.

Antiglycogen Substance in Blood of Gravidas.—Anselmino and Hoffmann demonstrated in the blood of gravidas a substance possessing the power of decreasing the glycogen content of a mouse's liver. It is present beginning with the second month of pregnancy and increases in concentration during the course of the pregnancy; beginning on the second day post partum its concentration decreases and by the eighth day it has disappeared completely. Its concentration is much less in the fetal blood than in the maternal blood. Two and five-tenths cubic centimeters of blood serum from a gravida at the end of

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pregnancy produces a decrease of as much as 75 per cent in the glycogen content of a mouse's liver. The substance was identified as thyroid hormone and in its action on the glycogen content of a mouse's liver 2.5 cc. of it corresponded to from 40 to 50 γ of thyroxin.

Beiträge zur Klinik der Tuberkulose, Berlin

76: 1-128 (Nov. 22) 1930

Pneumothorax Adhesions: Histology. I. Franz.—p. 1.
Id.: Indications for and Evaluation of Separation by Means of Thoracoscopy and Cauterization. G. Maurer.—p. 9.
*Curability of Acute General Miliary Tuberculosis in Nurslings. M. Zarfl.—p. 68.
*Possibilities of Error in Roentgen Diagnosis of Diseases of Lungs and Pleura. C. Kremser.—p. 79.
Intratracheal Injection of Iodized Poppy-Seed Oil: Complications. S. Erlandsson.—p. 105.
*Influence of Mouth Breathing and Spirography on Pulmonary Ventilation. H. Read.—p. 121.

Curability of Miliary Tuberculosis in Nurslings.—Zarfl discusses the high mortality of tuberculosis in nurslings and the particularly unfavorable prognosis of early infection with early generalization of the process. He reports a case of this condition in an infant who was infected with tuberculosis in the first month of life. At the end of the third month tuberculosis of the bronchial lymph nodes was present and by the eighth month there was present an acute general miliary tuberculosis of the pulmonary type with characteristic roentgen changes. The patient recovered both clinically and roentgenologically and two and one-half years later roentgen examination of the lungs revealed only numerous small areas of calcification. Four years has elapsed since the generalization of the tuberculosis. The case is reported as the first instance of recovery of a nursling from acute general miliary tuberculosis.

Sources of Error in Roentgen Diagnosis of Diseases of Lungs.—Kremser gives several case histories illustrated with twenty-nine roentgenograms to show some of the common sources of error in the roentgen diagnosis of diseases of the lungs and pleura. The great difficulty in the roentgen diagnosis of diseases of the chest is caused by the fact that the most varied pathologic processes produce the same or similar changes in the roentgenogram. As a result it is frequently impossible to make a definite diagnosis on the basis of only the roentgen examination.

Influence of Mouth Breathing on Pulmonary Ventilation.—Read studied thoracographically the influence of forced mouth breathing on the movement of the thoracic wall and demonstrated that a short "transitional reaction" was followed by a reappearance of the rest respiration. Determinations of the carbon dioxide content of the expired alveolar air during and after the mouth breathing revealed that a "respiratory insufficiency" was not produced by breathing through the mouth. Respiratory experiments with the Knipping apparatus revealed that in most persons there does not occur an appreciable change in the expired alveolar air and in the pulmonary ventilation. In 25 per cent of the cases the carbon dioxide content was increased. Emphasis is laid on the importance of a regular control of the expired alveolar air before and after each experiment.

Deutsche medizinische Wochenschrift, Berlin

56: 2205-2228 (Dec. 26) 1930

Hypertonia of Arteries. J. Pal.—p. 2205.
*Clinical and Experimental Investigations on Vaccination Encephalitis. A. Eckstein, H. Herzberg-Kremmer and K. Herzberg.—p. 2208.
Experimental and Clinical Studies on Cryptorchidism. H. F. O. Haberland.—p. 2210.
*Moro's Apple Diet in Treatment of Diarrheal Conditions. S. Wolff.—p. 2211.
Influence of Malaria on Resistance of Organism in Tuberculosis. H. Heinemann.—p. 2213.
Acid Therapy of Urologic Diseases. W. Grossmann.—p. 2214.

Investigations on Vaccination Encephalitis.—Eckstein et al. report the clinical observations on eighty-six children, aged between 4 and 20 months, who were vaccinated for the first time. They started the vaccinations with four different lymphs, which they had obtained from the vaccine institutions in Berlin, Cologne, Elberfeld and Dresden, respectively. Twenty-two children were vaccinated with animal lymph and the others were vaccinated with humanized lymph. The pustule formation was typical even after the lymph had made thirty-six human passages. The fever was milder and of shorter duration in the children who had been vaccinated with humanized lymph than in those who had been vaccinated with animal lymph. However, it would be wrong to infer from this that the immunity produced by humanized lymph is inferior to that produced by animal lymph. This problem the authors intend to investigate by revaccination in later years. Herzberg-Kremmer and Herzberg investigated the pathogenesis of postvaccinal encephalitis by comparing the presence of the vaccine virus in the organism of children with a normal course of vaccination with the occurrence of the virus in children who showed disturbances during the course of vaccination. The results of these tests indicate that the vaccine virus is a causal factor in postvaccinal encephalitis. Accordingly, it seems reasonable to employ human vaccine immune serum for the treatment of postvaccinal encephalitis. The authors further report investigations on the titer of humanized lymph. A decrease in the titer could not be observed even after thirty-six human passages.

Moro's Apple Diet in Treatment of Diarrheal Conditions.—Wolff discusses Moro's apple diet, which Moro described in the *Klinische Wochenschrift* (**8**:2414 [Dec. 24] 1929; abstr. THE JOURNAL, March 1, 1930, p. 673). Following a review of the history, Wolff describes the technic of this treatment. He gives special advice for the transitional diet. In all he employed the apple diet in 150 cases. Favorable results were obtained in acute dyspepsia, in dysentery, in chronic dyspepsia and in mucous enteritis. The author describes the clinical histories of three especially severe cases, which proved the great value of the method. Occasionally the diet has to be continued for four days instead of the usual two days. The author asserts that if the diet is properly individualized the results are completely satisfactory.

Klinische Wochenschrift, Berlin

9: 2329-2376 (Dec. 13) 1930. Partial Index

Disturbances in Sleep-Wake Mechanism as Symptom of Organic Disease of Brain. H. Pette.—p. 2329.
Therapeutic Experiments in Short Electric Wave Field. E. Schliephake.—p. 2333.
Cholesterol and Lecithin in Water and Acid-Base Balances. R. Degkwitz.—p. 2336.
Hyperinsulinism with Hypoglycemic Syndrome. F. Krause.—p. 2346.
Two Forms of Renal Insufficiency: Circulatory Insufficiency and Insufficiency of Uriniferous Tubules. E. Becher.—p. 2350.
New Method for Quantitative Determination of Glycuronic Acid in Urine. J. Sauer.—p. 2350.
Quantitative Determination of Glycuronic Acid in Urine as Test of Liver Function. J. Sauer.—p. 2351.
*Albumin Content of Urine in Persons Without Renal Disturbances. B. Minz.—p. 2352.
Method for Determination of Iopax in Urine. K. Hillgruber.—p. 2353.

Albumin Content of Urine in Persons Without Renal Disturbances.—The lack of a method by which it is possible to determine the presence of minute quantities of albumin in the urine was, according to Minz, the main reason why it could not be definitely decided whether the urine of normal persons contains albumin or not. The gravimetric methods do not reveal minor quantities. The author therefore employed the nephelometric method, and in order to obtain correct results he prepared a special standard solution. The tests were performed with the aid of an apparatus which is a combination of a colorimeter and a nephelometer. The technic is described in detail. In testing the urines of 100 persons the author did not detect a single one in which albumin was entirely absent. In normal persons the amount eliminated in the urine varied between 0.2 and 0.6 mg. per hundred cubic centimeters. If the average daily quantity of urine is taken as 1,500 cc., the quantity of albumin which is daily eliminated with the urine would be from 3 to 9 mg. That the albumin concentration in the urine is not influenced by consumption of large quantities of albumin was demonstrated by the fact that it was not increased after ten boiled eggs had been eaten. The albumin concentration remains the same in the course of a day and some times even during several weeks. However, a tabular report shows that there are considerable differences in the albumin content of the urine during various diseases. In persons with inflammatory conditions the values are usually high. The increased albumin content in hypertension is probably due to a beginning nephrosclerosis. The high values in diabetes

bring to mind the frequent concurrence of renal disorders. It has been repeatedly pointed out that albuminuria is not always a sign of a beginning renal disturbance. However, the author thinks that in diseases which frequently lead to renal disorder a quantitative determination of the albumin in the urine would often make possible an early and effective prophylaxis.

9: 2377-2424 (Dec. 20) 1930

Forms of Circulatory Weakness. C. Kroetz.—p. 2377.
*Prophylaxis of Acute Anterior Poliomyelitis. E. Moro.—p. 2383.
Theory of Mechanism of Diuresis. H. Marx.—p. 2384.
Relation Between Nephrosis and Glycosuria. H. Strauss.—p. 2388.
Jaensch's and Müller's Interpretation of Results of Capillaroscopy in Imbeciles. G. Knittel.—p. 2389.
Circulatory Minute Volume in Persons with Circulatory Insufficiency. C. Ernst and R. Weiss.—p. 2393.
Percutaneous Immunization by Means of Loewenstein's Diphtheria Ointment. H. Baar and H. Benedict.—p. 2395.
Relation Between Growth and Cardiac Disturbances. W. Gottstein.—p. 2396.
Encephalitic Cerebral Disturbances in So-Called Exsiccosis. M. Goldzieher.—p. 2399.
Blood Group Statistics. W. Weinberg.—p. 2400.
Idem. P. Hertwig.—p. 2400.

Prophylaxis of Acute Anterior Poliomyelitis.—Moro asserts that the observations of numerous investigators have proved that the serum of convalescents has virucidal powers against acute anterior poliomyelitis and that the blood of most adults has the same power. The virucidal action of the blood is mainly due to the presence of specific antibodies. In the therapy, however, the injection of blood from convalescents or from adults has not been effective. This failure is probably due to the fact that the injection is generally given too late. The therapeutic effects were more favorable when the injections were given during the preparalytic stage. However, since it is generally difficult to estimate the disease correctly during the beginning stage, the therapeutic value of injections of blood from convalescents or from adults is minimal. The author, however, recommends injections of blood from adults (convalescent blood is rarely obtainable) for prophylactic purposes. By this method he hopes to prevent epidemics of acute anterior poliomyelitis. Because the children of less than 5 years of age are mainly endangered, they should be given an injection of 20 cc. of fresh blood from one of their parents. He thinks that this procedure would give protection for a period of four weeks. If necessary, the injection would have to be repeated at the end of that period. In large cities nearly all adults over 15 years of age have specific protective substances in their blood, and the injection from one adult usually gives sufficient protection. In rural districts, however, only about 50 per cent of adults possess specific antibodies and here it would be necessary to inject mixed blood (from both parents), or serum from adults living in the city could be used.

Medizinische Klinik, Berlin

26: 1881-1916 (Dec. 19) 1930

Operative Treatment of Chronic Inflammation of Adnexa. Siegert.—p. 1881.
Active Immunization Against Diphtheria with Subneutral Mixtures. R. Otto and G. Blumenthal.—p. 1886.
*New Method for Roentgen Demonstration of Liver and Spleen. P. Radt.—p. 1888.
Anticutins as Source of Error in Pirquet's Reaction. E. Hoke.—p. 1891.
Spontaneous Perforation of Ureteral Calculi. K. Lion.—p. 1892.
Newer Results of Experimental Acid Injuries and Their Evaluation in Diabetes and in Muscular Rheumatism. A. Slauck.—p. 1896.

New Method for Roentgen Demonstration of Liver and Spleen.—Radt describes a method which makes it possible to show the liver and spleen as dense shadows in the roentgenogram. The hypothesis on which he bases his method is the following: Certain colloidal substances, when parenterally administered, become deposited as small granules in the reticuloendothelial system. Thus spleen and liver become permeated with finest granules. The author reasoned that if a colloid would be used, which is impermeable for roentgen rays, its deposits in the liver and spleen would produce a more dense shadow in the roentgenogram. Moreover, he reasoned that those parts of the liver and spleen (either tissues or fluids), which do not have the capacity to deposit the colloid would be permeable for roentgen rays and the roentgenogram would show differences against the other organ tissues. It could therefore be expected that the method would not only reveal the shape and size of the liver and spleen but would also show changes within the organ; especially in those cases in which as a result of proliferation the connective tissue had encroached on the parenchymal cells. With the help of this method the author could diagnose a cirrhosis of liver and several times he detected cancerous nodules within the liver. He thinks that it might also be possible to detect abscesses, echinococcus cysts or hemangioma in the liver or spleen. The contrast colloid that was found most satisfactory is a thorium dioxide solution of a certain dispersion, which has been so stabilized by carbohydrates that no body fluid will cause flocculation. The injection is given intravenously. In human beings, from 40 to 80 cc. is required. However, this quantity is not injected at once but rather in daily divided doses of from 10 to 20 cc. The injections were never followed by serious complications. Only in a few cases were temporary discomfort, chills and increased temperature noted, but they disappeared quickly. Control of the blood picture revealed a temporary leukocytosis and a slight, likewise only temporary, decrease in the hemoglobin content. Chemical examinations of the blood and urine did not reveal abnormalities. The author made numerous experiments on animals and employed the method on twenty patients. He shows several roentgenograms of patients and comes to the conclusion that this method represents an advance in the diagnosis of disturbances of the liver and the spleen.

Münchener medizinische Wochenschrift, Munich

77: 2215-2230 (Dec. 26) 1930

Gold Therapy of Chronic Polyarthritis. W. Fehlow.—p. 2215.
Difficult Dentition. M. Hohlfeld.—p. 2217.
*Galactorrhea Continuing Several Months After Death of Child. F. Ronnefeldt.—p. 2218.
Treatment of Angina Pectoris. H. Mezger.—p. 2219.

Galactorrhea After Death of Child.—Ronnefeldt reports the case of a woman, aged 18, a native of Liberia (Africa). Six months previously she had given birth to her first child, but it had died four days after birth. Since the death of the child, the milk secretion had not ceased. The woman did not have pains, but the breasts were always full, and milk was continually discharging in drops from both of them. The patient was given three times daily 15 drops of spirit of camphor, and after three days the milk secretion ceased.

Wiener klinische Wochenschrift, Vienna

43: 1589-1620 (Dec. 25) 1930

*Rôle of Liver in Decompensation of Heart. E. Zak.—p. 1589.
Biologic Action of Ultrashort Waves. S. Jellinek.—p. 1594.
*Newer Methods for Treatment of Bone Fractures. L. Böhler.—p. 1596.
Experimental Foundations of Stomach Therapy in Abnormal Hematologic Conditions. K. Singer.—p. 1597.
Studies on Significance of Placenta. W. Ortloph.—p. 1600.
Various Forms of Vomiting in Children. H. Mautner.—p. 1603.

Rôle of Liver in Decompensation of Heart.—In the first part of the article Zak shows how some parts of the skin are influenced by certain dysfunctionings of the liver. With the development of an engorged liver during decompensated circulation, the water depots of the skin become filled. Thus the venous part of the circulation becomes disburdened. The increased avidity of the tissues for water has the effect that the external elimination, namely, perspiration, is reduced, and that is why the surface of the skin is usually dry while the tissues contain large quantities of fluids. Experiments proved the correctness of the clinical observations, and the author concludes that in chronic engorgement of the liver in patients with heart disease there exists a disturbance of the normal relation between the liver and the water content of the tissues.

Newer Methods for Treatment of Bone Fractures.—Reduction and fixation are, according to Böhler, the most important factors in the treatment of bone fractures. The reduction is usually accomplished without great difficulty, but the fixation is often difficult. In fractures of the shaft of the forearm in which it is extremely difficult to prevent displacement of the fragments, the author advises that rust-free wires be passed through the bones and then that a plaster-of-paris cast be applied. After the cast has become hardened, the ends of the wires are fastened by means of set-screws, which in turn are fastened by a plaster-of-paris bandage. In fractures of the os calcis both reduction and fixation are difficult. Because manual reduction is not possible, a nail is put through the tuber calcanei and a

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second one through the tibia, and the fracture is reduced by means of the screw traction apparatus. Then a plaster-of-paris cast is applied. The nails are not removed immediately but remain for from four to five weeks. Medial and intracapsular fractures of the neck of the femur may be treated either by the application of a plaster-of-paris cast or surgically. In pseudarthrosis of the neck of the femur the author recommends subtrochanteric osteotomy. Beck's method of bone boring he recommends in pseudarthrosis in the shaft of long tubular bones.

Zeitschrift für Kinderheilkunde, Berlin

50: 381-508 (Dec. 30) 1930

Pathogenesis of Craniotabes. H. Abels.—p. 381.
*Endocrinopathies in Children. M. S. Massloff.—p. 431.
Congenital Cystic Malformations of Lungs in Nurslings: Diagnosis. C. Hünermann and H. Sievers.—p. 451.
Arterial Hypertension and Allergy. A. S. Sokolow.—p. 461.
*Nutritive and Growth Values of Zwieback. I. Abelin.—p. 465.
Physiology of Digestion in Nurslings. O. Budde.—p. 482.
*Chlorine Content of Blood in Scarlet Fever and Diphtheria. A. A. Markowa.—p. 496.
Feer's Disease and Calciuria. R. Glauber.—p. 503.
Preallergic Period of Tuberculosis. J. Ligner.—p. 505.

Endocrinopathies in Children.—According to Massloff, endocrinopathies constitute 4.4 per cent of all the diseases of children. In early infancy they are characterized principally by growth disturbances and manifestations of spasmophilia; later, disturbances in the metabolism of fat, water and sugar become of increasing importance. The part played by constitutional predisposition in the development of endocrine disturbances and in the peculiarities of the clinical picture is undisputed. Another important part in the development of various forms of growth and metabolic disturbances in children is played by the central and sympathetic nervous systems. In addition to the purely endocrine disturbances in the growth and metabolism there undoubtedly exist purely dystrophic disturbances. In the investigation of endocrinopathies in children, in the making of a prognosis and in the outlining of the treatment the constitutional factor should be given more consideration than it receives at the present time. Of great importance in the differential diagnosis of the various endocrinopathies are the determination of various indexes and the plotting of the anthropometric curve.

Nutritive and Growth Values of Zwieback.—In feeding experiments on rats, Abelin demonstrated that the toasting process which zwieback undergoes after it is baked greatly decreases its growth value. The proteins of flour are poor in several biologically important amino-acids and diamino-acids. Some of the growth producing amino-acids, as lysine, are destroyed by the baking and the subsequent heating. This was proved by the fact that the oral administration of extremely small quantities of lysine (20 mg. a day) increased the rate of growth of rats on an exclusive zwieback diet. When the administration of lysine was discontinued, the growth of the animals was arrested. Lysine added to the zwieback dough and then subjected to the baking and toasting process did not prevent the arrest of growth. That the harmful factor is the toasting process rather than the baking was shown by the much better growth of animals on a diet of baked but untoasted zwieback than on a diet of regular zwieback. This modification of the biologically important protein components is more important than the vitamin deficiency. Despite the daily administration of 1 cc. of fresh brewery yeast, of lecithin or of from 2 to 5 cc. of milk, the rats on the zwieback diet did not show a satisfactory increase in weight. The substances with a high vitamin content, as butter and whole milk, which are frequently used in making zwieback, do not give to the finished product a sufficient growth producing action. In young rats that are kept on an exclusive bread-zwieback diet there occurs an extensive falling out of the hair. The addition of a minute quantity of dried thyroid substance to the diet arrests the alopecia and stimulates the growth of the hair.

Chlorine in Blood in Scarlet Fever and Diphtheria.—In determinations of the chlorine content of the blood in sixty-two cases of scarlet fever and diphtheria, Markowa found that in the early stage of both of these diseases the amount of chlorine in the blood is below normal. The degree of the diminution is directly dependent on the severity of the disease. The cause of the subnormal chlorine content of the blood in the early stage of scarlet fever and diphtheria is the specific infection and not the accompanying complications.

Zeitschrift für Krebsforschung, Berlin

33: 189-319 (Dec. 22) 1930

Action of Material Free from Tumor Cells and Material Containing Tumor Cells on Liver, Spleen and Kidneys of Animals. R. Erdmann.—p. 189.
*Skin Cancer: Production by Prolonged Ultraviolet Irradiation. W. Putschar and F. Holtz.—p. 219.
Immunity to Tumors: Immunizing Power of Homologous Muscle Autolysate. I. Costero.—p. 261.
Occurrence of Tumor Cells in Circulating Blood of Animals with Inoculation Tumors. P. Jonescu.—p. 264.
Factors Concerned in Etiology and Treatment of Tumors. H. Auler.—p. 281.
Relation Between Suprarenals and Growth of Tumors. H. Auler and W. Rubenow.—p. 292.
*Influence of Sympathetic Nervous System and Nutrition on Development of Experimental Tumors. M. Eiger and E. Czarnecki.—p. 296.
Incidence of Cancer. A. M. Merkow.—p. 302.

Skin Cancer: Production by Prolonged Ultraviolet Irradiation.—Putschar and Holtz chose rats instead of mice for their experiments because of the fact that whereas the spontaneous development of cancer is relatively frequent in white mice it is extremely rare in rats. A strain of rats was used in 10,000 of which over a period of three years not a single spontaneous skin tumor was observed. It was found that cancer of the ear could be produced with great regularity without the aid of chemical agents by prolonged ultraviolet irradiation. The carcinomas appeared at the earliest after twenty-seven weeks of continuous irradiation. By the end of the thirty-seventh week, all the six animals had cancer. A definite relation between the color of the skin and the susceptibility to cancer was not demonstrated. The administration of viosterol changed neither the susceptibility to tumors nor their rate of growth. Changes in the elastic tissue in the skin were of a purely retrogressive nature; they did not show any relation to the development of cancer but were a manifestation of chronic ultraviolet ray dermatitis. The specific action of the ultraviolet rays consisted in the production of a periodic regeneration of the hair with a marked increase in the number of lanugo hairs and the development of giant hairs. The authors believe that there exist close histologic relations between ultraviolet ray cancer and the precancerous light dermatoses that occur in man. The experiments prove the etiologic rôle of ultraviolet rays in cancer of the skin in human beings .

Influence of Sympathetic Nervous System on Development of Experimental Tumors.—In experiments on rabbits, Eiger and Czarnecki demonstrated that the sympathetic nervous system has a positive, inhibitory influence on the development of tar epitheliomas. The nutrition also is of importance; in rabbits kept on a diet of oats, the development of tar epithelioma is accelerated. The experiments confirm the correctness of the contention of some investigators who consider it necessary to emphasize the importance of precancer.

Zentralblatt für Gynäkologie, Leipzig

54: 3265-3337 (Dec. 27) 1930

Genu Recurvatum Congenitum. F. A. Wahl.—p. 3265.
*Rational Salicyltherapy in Leukorrhea. H. Schmidt.—p. 3269.

Rational Salicyltherapy in Leukorrhea.—Schmidt points out that in recent years salicylic acid has been employed in the treatment of leukorrhea. In some cases, however, it has been used in too high concentrations (12.5 per cent), and the result was that occasionally exacerbations were observed, and many patients complained of burning pain in the vagina. In order to eliminate these disadvantages, salicylic acid was used in a 1 or in a 4 per cent solution. It is administered by means of glycerin suppositories, which are introduced into the posterior vault of the vagina. They are melted by the body temperature, and the effective substance becomes evenly divided and comes in contact with all diseased portions. The use of glycerin is especially advantageous because of its hygroscopic power, which effects a withdrawal of the cell fluids, so that now, as a result of a reversal of the osmotic pressure, a resorption of the salicylic acid becomes possible. Before the use of the glycerin suppositories the effective medicament was frequently discharged again before it became effective. In order to increase the action of

the salicylic acid the author dries the vaginal mucous membrane by means of small compresses before introducing the suppository. If this is done, the hygroscopic power of the glycerin can attack the cells directly, and the 1 per cent solution of salicylic acid is not made ineffective by mixture with the vaginal secretion. For this reason it is advisable that the physician should introduce the suppositories. The author asserts that most cases of nongonorrheal leukorrhea can be effectively counteracted in from eight to twelve days. If the patient introduces the suppositories herself, it is advisable to employ suppositories containing the 4 per cent solution of salicylic acid, because the patient does not remove the vaginal secretion. If erosions of the portio vaginalis exist, the 4 per cent solution is likewise advisable. That this treatment has lasting effects is proved by the fact that relapses did not occur, although in some of the patients the treatment was concluded from three to six months previously.

Kazanskiy Meditsinskiy Jurnal, Kazan

26: 955-1064 (Oct.) 1930

*Chemical Study of Manoilov's Reaction. B. Khromov.—p. 957.
*Influence of Diathermy on Gastric Functioning. L. Klyachkin and E. Mogilevskiy.—p. 963.
Case of Paroxysmal Hemoglobinuria. G. Nagibin.—p. 969.
Value of Skin Reaction in Typhoid. V. Sharovskaya.—p. 972.
Surgical Treatment of Incised Wounds in Throat and Larynx. I. Tsimkhes.—p. 984.
Nine Cases of Resection of Superior Hypogastric Plexus. I. Orlov.—p. 989.
Classification of Purpura in Children. A. Kisel.—p. 1012.
Constitution and Psychotherapy. G. Gerenshtein.—p. 1020.

Chemical Study of Manoilov's Reaction.—The object of Khromov's researches was to ascertain the influence of hemoglobin on Manoilov's reaction. A 4 per cent solution was prepared with commercial amorphous hemoglobin; then, by adding distilled water to this basal solution, a scale of various concentrations was obtained. A dose of 3 cc. of a solution was used for the reaction (the third modification method). Only solutions containing more than 1 per cent of hemoglobin proved to influence somewhat the reaction; namely, the coloration pointed then to a female blood. Since solutions containing about 0.5 per cent of hemoglobin are commonly used for Manoilov's reaction, the effect of hemoglobin is not of significance. Evidently hemoglobin does not assume the rôle of a specific protein. When a higher concentration (more than 1 per cent of hemoglobin) was used, the coloration corresponded to that of female blood instead of that of male blood, as could be expected on account of a larger amount of hemoglobin in the male blood. Thus the hemoglobin acted as a nonspecific protein. Further, it appeared that the results of Manoilov's reaction were correct although identical hemoglobin solutions were used; that is, when the difference of hemoglobin contained in the male and female bloods was eliminated. Moreover, blood serum, ascitic fluid, cerebrospinal fluid and urine, which are free from hemoglobin, serve for the reaction. Another series of researches was made with iron protoxides and iron oxides. The basal solution contained 0.558 per cent of iron; it served for the preparation of solutions of lower concentrations. A dose of 3 cc. of a solution was used for the reaction. Solutions containing not more than 0.15 per cent of iron proved not to influence appreciably the reaction; with solutions containing more than 0.2 per cent of an iron protoxide, the coloration changed to green or to blue. Obviously there is no connection between the reaction and the amount of iron in the blood; otherwise a solution containing 0.15 per cent of iron would change the coloration to that of the male blood (usually a solution of about 0.0015 per cent of iron is used for the reaction). The results were identical whether a solution of an iron protoxide or of an iron oxide served for the tests. Hence the atomic property of the blood iron is without influence on the reaction.

Influence of Diathermy on Activity of Stomach.—The observations of Klyachkin and Mogilevskiy were made on forty-two patients with various dyspeptic disturbances. A combined chromoscopic and fractional method was used for exploration of the gastric secretion. The gastric contents were removed while the person was fasting, and immediately afterward 2 cc. of a 1 per cent aqueous solution of neutral red was injected intramuscularly. Evacuation of the stomach was repeated with the person fasting, twice at a ten minute interval, and the gastric juice secreted within thirty minutes was examined. Then a caffeine test meal (Ratsch and Kalk) was introduced with a catheter, and the gastric contents were withdrawn every fifteen minutes for about two and a half hours. For determination of the gastric motility, phenolphthalein was added to the test meal. The same procedure of exploration was repeated after the diathermy treatment. One electrode, of from 100 to 150 sq. cm., was applied to the gastric region, and another electrode, of from 150 to 200 sq. cm., was parallelly applied to the back. A current of from 1 to 1.5 amperes was used; the duration of each sitting was half an hour. Repeated examinations after the treatment were made on twenty-five patients. There were no changes of gastric secretion in three of six patients with hyperacidity. In one the gastric juice secreted during fasting was reduced by 40 cc. In two, the decrease of the gastric juice was by 82 cc.; besides, elimination of the neutral red appeared prolonged by three minutes (from nine to twelve minutes) after fifteen sittings of diathermy. In five of seven patients with a normal gastric acidity, the diathermy treatment proved to be without action on the gastric secretion and motility. In one instance the secretion of the gastric juice increased by 64 cc.; elimination of the neutral red occurred in twelve instead of eighteen minutes. In another patient the gastric acidity was notably decreased. In two of three patients with hypo-acidity the gastric juice remained unchanged; in the third there was an increase of the gastric acidity and of the gastric secretion (by 54 cc.) and an accelerated elimination of the neutral red. In nine patients free hydrochloric acid was absent and the gastric secretion was notably reduced; in five of them elimination of the neutral red did not occur. In only two cases in which elimination of the neutral red was not entirely abolished did the diathermy treatment result in the appearance of free hydrochloric acid and in an increase of the gastric secretion. In the remainder, no changes were observed after fifteen sittings. These cases of achylia presented a group of "complete and true anacidity" in which the lesions of the gastric parenchyma were severe. The authors conclude that, in cases of gastric hyperacidity, diathermy treatment is followed by an improvement of the subjective as well as the objective signs. In cases of organic achylia, the treatment had no influence on the gastric secretion; but it induced improvement of the general condition and caused the disappearance of subjective signs which had previously resisted various remedies and diets. Therefore diathermy is recommended for patients with dyspeptic manifestations, regardless of the condition of the gastric acidity.

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Study of Typhoid Epidemics in Finland During Famine. R. Sievers.—p. 859.
*Treatment of Colipyelitis with Bacteriophages. C. Nyberg.—p. 926.
*Benign Tumors in Striated Muscle. G. Tallqvist.—p. 934.

Treatment of Colipyelitis with Bacteriophages.—Nyberg reports three cases of acute colipyelitis treated with bacteriophages with good results. He says that in chronic cases it is difficult to find effective bacteriophages; frequently two or more strains of colon bacilli appear in the urine and each of them requires a special bacteriophage.

Benign Tumors in Striated Muscle.—Tallqvist affirms that primary connective tissue tumors of myxomatous nature occur in the striated muscles. They are usually fibromyxomas, and all transition forms between pure myxomas and pure fibromas are found. The tumors are as a rule benign. Four cases are described: a myxoma, a fibromyxoma, a fibroma and a desmoid tumor.

Ugeskrift for Læger, Copenhagen

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*Case of Pneumaturia. H. Tønnesen.—p. 1171.

Case of Pneumaturia.—Tønnesen's patient was a man, aged 60, with stricture of the urethra and infection of the urinary tract with *Bacterium lactis-aerogenes*. The pneumaturia was due to a small fistulous connection between the intestine and the bladder. Progressive dilation with occasional lavage renders his condition tolerable.

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